Master of Science in Economics

The influence of *Doing Business'* institutional variables in Foreign Direct Investment

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Abstract

Dissertation Title: The influence of Doing Business' institutional variables in Foreign Direct Investment

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The growing importance of institutions as a determinant of inward FDI has sparked interest in determining their relationship. In the present study, we intended to explore the relationship between the institutional variables of the Doing Business report and inward FDI. The main question is whether Doing Business indicators explain worldwide differences in FDI. Doing Business is an international report that describes the business environment in various countries, through quantitative and qualitative indicators of the functioning of representative institutions. Our analysis covers 33 advanced economies and 144 developing countries for the 2004-2009 periods. The major implication is that in general, a better rated business environment is more likely to attract greater amounts of FDI, especially in case of developing countries. Moreover institutional areas that are most likely to influence inward FDI are: starting a business, registering a property and trading across borders.

Keywords: Foreign Direct Investment, Institutional determinants, Doing Business.

Sumário Executivo

Título da Dissertação: A influência das variáveis institucionais do Doing Business no Investimento Directo Estrangeiro

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A crescente importância das instituições como factor da captação de IDE tem suscitado interesse na determinação da sua relação. No caso da presente análise, a relação que se pretende explorar é entre as variáveis institucionais do relatório Doing Business e o IDE realizado no interior de cada país. A principal questão é se o Doing Business explica as diferenças mundiais de IDE. O Doing Business é um relatório internacional que descreve o ambiente empresarial de diversos países, através de indicadores quantitativos e qualitativos representativos do funcionamento das instituições. A análise abrange 33 países desenvolvidos e 144 países em desenvolvimento para o período de 2004 a 2009. A grande conclusão é que, em geral, um país classificado de um melhor ambiente empresarial está mais susceptível de atrair maiores montantes de IDE, especialmente no caso dos países em vias de desenvolvimento. Além disso, as áreas institucionais que mais influenciam o montante de IDE são: abrir uma empresa, registar um imóvel e comércio com o exterior.

Palavras-chave: Investimento Directo Estrangeiro, determinantes institucionais, Doing Business.

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1. Introduction

This article analyzes the role of Doing Business[1] indicators in inward Foreign Direct Investment (FDI), for the 2004-2009 period. These indicators are indicative of the level of institutions' quality of a country. These indicators are divided in eleven areas, namely starting a business, dealing with construction permits, registering property, getting credit, strength of investor protection, paying taxes, trading across borders, enforcing contracts, closing a business (or resolving insolvency), employing workers and getting electricity. Due to data availability, this study does not consider these two latter areas.

FDI has assumed an important role in income growth, employment, modernization and economic development of a country (OECD 2002). A large number of studies have demonstrated indication of a strong positive correlation between FDI and growth of GDP per capita (Mariam Khawar, 2005). The great importance of FDI justifies the continuing research work. The common trend of all research has been the demand of the determinants affecting FDI. In our work, the focus is on institutional determinants.

The International Monetary Fund[2] defines

> *FDI as a category of international investment that reflects the objective of a resident in one economy (the direct investor) obtaining a lasting interest in an enterprise resident in another economy (the direct investment enterprise). The lasting interest implies the existence of a long-term relationship between the direct investor and the direct investment enterprise, and a significant degree of influence by the investor on the management of the enterprise. A direct investment relationship is established when the direct investor has acquired 10 per cent or more of the ordinary shares or voting power of an enterprise abroad.*

[1] The international report of Doing Business is explained in section 1.2 and the respective variables in the appendix 1.

[2] FMI, *Foreign Direct Investment - Trends, Data Availability, Concepts, and Recording Practices* (2004), p.3

Statistics show that FDI's contribution to GDP has been increasing over the years (Figure 1). Countries show a general trend of positive growth, reaching a peak in 2007. Transition countries reach the highest peak at about 40%, however, they suffered a strong decrease, of about 20%, in 2008. Developed countries display exactly the same trend in terms of contribution of FDI to GDP. This group of countries has the highest weight in terms of inward FDI in the entire world (Figure 2).

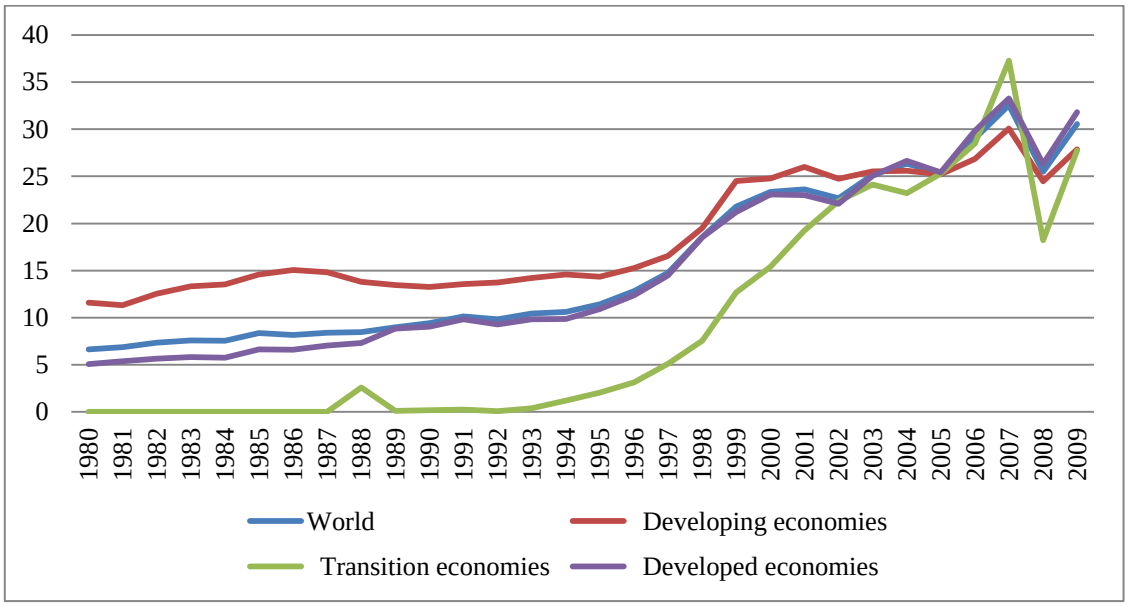

Figure 1: Inward Foreign Direct Investment stock as percentage of Gross Domestic Product (1980-2009). Source: UNCTAD

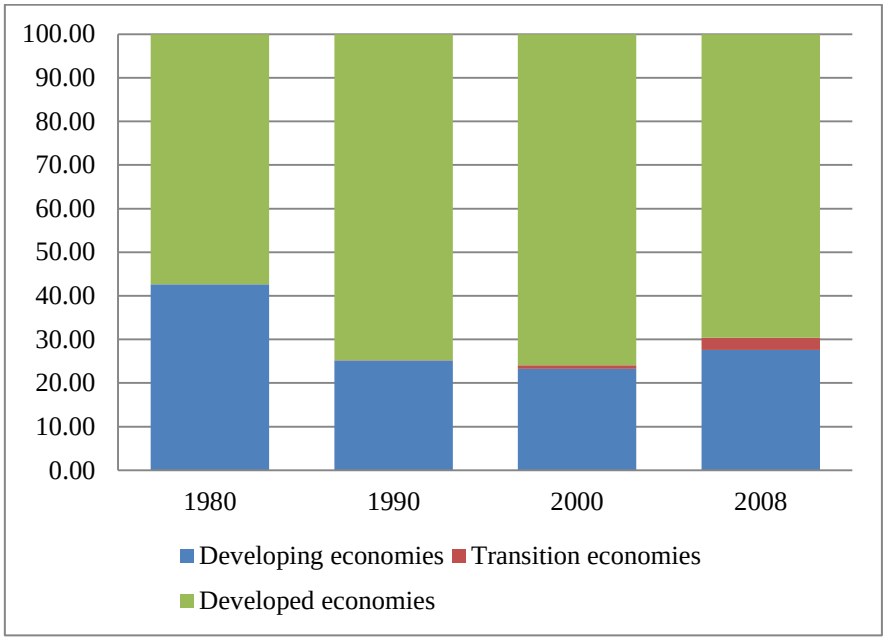

Figure 2: Inward Foreign Direct Investment stock as percentage of world (1980, 1990, 2000 and 2008). Source: UNCTAD

The growing importance of FDI in the countries' economy justifies an analysis of costs and benefits of such investment. In this sense, multinationals can not only maximize the benefits, but especially minimize the costs. FDI contributes to higher economic growth through a range of benefits at various levels. These benefits are connected to technology transfers, improved use of its resources, introduction of new processes, learning-by-observing allowing human capital enhancement, international trade integration and enterprise development. In other words, FDI creates a more competitive business environment (OECD, 2002). Besides these benefits, the host country can still try to improve their business environment through policies to attract FDI inflows. According to Lougani and Razin (2001) and Feldstein (2000) the presence of foreign firms leads host country to take more rational policies and to contribute to the smooth function of institutions.

However in view of Oman (2000), this attempt to improve the business environment in order to increase competitiveness may bring adverse effects. Actually a multinational firm's decision to invest in another country is determined by lower costs and higher efficiency considerations (Alfaro, Chanda, Ozcan and Sayek, 2004), so host countries tend to implement policies that contradict some environmental protocols and labor rights. These effects of competition in view of Oman (2000) are one of the potential negative effects of the presence of foreign investment. The repatriation of profits, the absence of positive linkages with local communities and the loss of political sovereignty are other of the potential costs of FDI (OECD, 2002).

The big question relates to whether FDI produces growth effects on host countries. In fact, the literature has shown that a host country only benefits from FDI, and more specifically from growth effects, under certain conditions. According to Alfaro, Chanda, Ozcan and Sayek (2004), the existence of well-developed financial markets are crucial to profit from growth effects. However, the literature suggests that a minimum threshold stock of human capital is also necessary (Borensztein, Gregorio and Lee, 1997). On the other hand, the host country cannot fully benefit from the positive effects of FDI, given the crowding out effect of domestic investment.

1.1. Institutions

The importance of institutions in the society began to be more prominent by one of the major and earliest contributors to Institutional Economics, North. According to North (1991, p. 97), institutions can be understood as he described:

> *Institutions are the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights). Throughout history, institutions have been devised by human beings to create order and reduce uncertainty in exchange. Together with the standard constraints of economics they define the choice set and therefore determine transaction and production costs and hence the profitability and feasibility of engaging in economic activity. They evolve incrementally, connecting the past with the present and the future; history in consequence is largely a story of institutional evolution in which the historical performance of economies can only be understood as a part of a sequential story.*

In order to better understand the importance of institutions in society, it makes sense to first determine exactly what their role is. In accordance with the World Development Report 2002, institutions have three pillars of action. They are a means of transmitting information about market conditions, goods and agents; a way of facilitate or impediment of competition in markets; and moreover define and enforce property rights and contracts.

North argues that the main function of institutions in a society is to reduce the uncertainty in the sense of defining the rules of the game and, more important determines the security of property rights (North, 1990). In economic terms is crucial guarantee the property rights, in the sense that no individual or any firm will appreciate the rights (income, contractual obligations and other usufruct) over the assets but the person or company legally owns those property rights.

The economic significance of institutions in a society has been the subject of many investigations. In general has been shown a positive relationship between institutions and economic growth.

By contraposition, a society where there is political instability, derived from revolutions, coups and political assassinations, property rights are not secured, creating a climate of uncertainty, which is not conducive to private investment and in turn to economic growth (Barro, 1991). Political reform must go through the political institutions in order to reduce political instability and polarization in developing countries, which also have impact on the quality of property rights (Svensson, 1998). The quality of property rights is crucial in the way that their security determines the magnitude of investment and even more important the efficiency with which resources are allocated (Knack and Keefer, 1995). According to Mauro (1995), the functioning of the institutions, that is the level of bureaucracy and corruption, is as important in determining investment and growth as the level of political instability. So a society where the bureaucracy and corruption are reduced shows higher levels of investment and growth.

More recent authors also demonstrate that a country with a healthy functioning of its institutions reveals a greater attraction for investment. Acemoglu and Johnson (2005) p.1, *find that property rights institutions have a first-order effect on long-run economic growth, investment, and financial development.*

1.2. Doing Business Report

The Doing Business report is an international report sponsored by the World Bank. It aims to provide an objective and comparative basis for understanding and improving the business environment.

The analysis reports to eleven areas of regulation - starting a business, dealing with construction permits, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts, closing a business, employing workers and getting electricity. These areas are composed by several indicators which provide a quantitative measure of the degree of bureaucracy in a country in various areas.

However, they do not cover some aspects of business regulation such as, measure security, macroeconomic stability, corruption, labor skills of the population, specific regulation to foreign investment or quality of infrastructure. In the present analysis only 9 areas of the Doing Business report are analysed, given the availability of information. Which are starting a business, dealing with construction permits, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and closing a business. Therefore 33 variables are used. In appendix 1 we present their definitions and explain how the original variables were converted into indexes. The use of indices allows a better comparison of the levels among countries and among the institutional areas. Moreover, the conversion allowed to aggregate information from various variables relating to an area in a single index. And finally, allowed to summarize information from various institutional areas in a single index that we called global.

Doing Business indicators are built on standardized definition of scenarios. Moreover, the fact that it reports to five consecutive years for the same set of countries and indicators allow us to understand the evolution of regulatory business environment.

The diverse and comprehensive set of indicators that the Doing Business report is constituted, is of great useful by research. Many working papers and articles, use databases that contain indicators of this international report. Among some of the findings, the most relevant according to *About Doing Business: measuring for impact*[3],

- *Lower barriers to start-up are associated with a smaller informal sector*[4].
- *Lower costs of entry encourage entrepreneurship, enhance firm productivity and reduce corruption*[5].
- *Simpler start-up translates into greater employment opportunities*[6].
- *The quality of a country's contracting environment is a source of comparative advantage in trade patterns. Countries with good contract enforcement specialize in industries where relationship-specific investments are most important*[7].

[3] Site of Doing Business, *http://www.doingbusiness.org/*

[4] For example, Masatlioglu and Rigolini (2008), Kaplan, Piedra and Seira (2007), Ardagna and Lusardi (2009) and Djankov (2009b).

[5] For example, Alesina and others (2005), Perotti and Volpin (2004), Klapper, Laeven and Rajan (2006), Fisman and Sarria-Allende (2004), Antunes and Cavalcanti (2007), Barseghyan (2008), Djankov and others (2010) and Klapper, Lewin and Quesada Delgado (2009).

[6] For example, Freund and Bolaky (2008), Chang, Kaltani and Loayza (2009) and Helpman, Melitz and Rubinstein (2008).

[7] Nunn (2007).

- *Greater information sharing through credit bureaus is associated with higher bank profitability and lower bank risk*[8].

Doing Business is a fundamental instrument in evaluating the business environment of a country. The great diversity of areas covered by the indicators of regulation and the enormity of countries of different levels of wealth allows the comparability of different business environments. It permits to establish a relationship between indicators of business environment and levels of economic growth, as well as between the levels of bureaucracy and the poverty, corruption, employment, access to credit and ease of establishing business. In turn, allows identifying the best practices in the countries better ranked that is where it is easier to do business. Finally, give the possibility to define a strategy of reforming the business environment, i.e. the functioning of institutions. Doing Business corresponds to an international instrument on "behavior change" not only to motivate national investors but to attract foreign investors too.

The current importance that FDI has to economic growth of a country sustains an interest in reviewing the quality of institutional business environment. Doing Business emerges as a tool to assist with this review. However, there are no empirical studies that establish a relationship between FDI and the indicators of this international report. Indeed, the Doing Business indicators have been used in the context of investigations into the FDI, but are still very few studies. For examples in areas of legal system (Djankov et al, 2002), regulation of entry of firms (Djankov, 2009) and investors protection (Djankov et al., 2008). In addition, none of these studies employed all the indicators of different areas to explain a question about the FDI. The areas that most interest raised by the existing studies were the regulation of entry and regulation of work.

It makes economic sense that when a country is well ranked in the Doing Business, it is able to attract larger amounts of FDI. But empirically expected relationships do not exist to substantiate this idea. In practice, many countries are using this report as a signal of their attractiveness to foreign and domestic investment. But are they using it correctly? Are all areas that make up significant to investment explanation? In other words, regulatory reform of business environment should go through all the areas to be competitive? What are the priority areas to take action?

[8] Houston and others (2010).

These are some of the issues that raise the need for an econometric study, in looking for determination of the statistical significance of each indicator and each area of regulation in determining FDI.

1.3. Paper Organization

Section 2 provides the theoretical and empirical literature review of the importance of the institutions on FDI.
Section 3 describes the model and dataset used in this thesis. Also sets out the estimation procedure and the results obtained.
Section 4 describes the policy implications based on the results obtained in the previous section.
Section 5 concludes, presents some policy implications, presents some limitations of this study and suggests new questions for future research in this area.

2. Literature Review

To understand the importance of institutional determinants for FDI requires a waiver of its evolution at theory and empirical levels, allowing a better foundation of this study.

2.1. Theoretical review

Establishing a relationship between the quality of institutions of a country and its volume of FDI requires a theoretical foundation behind based on two issues. On the one hand the existence of factors that determine the investment incentive, and more specifically the investment abroad. On the other hand the theoretical verification that FDI determinants, particularly institutional ones, have influence on the economy. The first question is answered by Dunning's OLI paradigm or the Eclectic paradigm, while the second question is clarified by North.

The Eclectic Paradigm of International Production of John Dunning (1993 and 2000) appears as a statement of reasons for becoming a multinational company. According to this theory, the propensity for a company focusing on international production is explained by the verification of three important conditions. The first and foremost condition that determines the decision to become a multinational company is the ownership advantage, which is the possession of certain assets that naturally exist in his country but that other companies in other countries do not have access. Verification of this condition means that the additional costs adjacent to the company's expansion to another country are more than offset by the privileged possession of these assets, compared to the host country of investment. The second and third conditions follow the verification of the first condition. If a company has ownership-specific advantages, should maintain the respective right to use only among its subsidiaries and never sell them to other competitors, much less to foreign companies. Thus, the company holding the ownership advantage is creating another condition or other advantage to become multinational, Dunning called internalization advantage or I advantages. Finally, if the company seek to benefit from a specific point of the country it is located, the locational advantage or L Advantage, a combination will be doing more profitable (Dunning, 1987). The eclectic paradigm is one of the theoretical models used to support the determinants of FDI. However, their use raises some criticism. The enormous amount of explanatory variables used in the model that reduces its own

explanatory power, the interdependence between the variables OLI, OLI paradigm as an approach to static comparative and the fact that I advantage and the eclectic paradigm are explaining the same phenomenon. Following criticism are attempts to reconfigure or extend the model of Dunning. The Investment Development Path (IDP) is one of the first applications of the OLI paradigm. This extension examines how the evolution of the set of comparative advantages has influence in the development stage of a country, and in turn on investment. Another application is to face FDI as an additional competitive advantage, which is the acquisition of new technological and market knowledge arising from the relationship abroad. A third application adds that hold the ownership advantage is not just the privileged possession of certain resources, but also the ability to influence price, quality and innovation on assets. Finally, an extension of the OLI paradigm uses the theory of comparative advantage to explain trade patterns (Dunning, 2001).

The theory of institutions from North clarifies how institutions influence the performance of the economy and also the FDI. North starts with the theory of human behavior and combines it with the theory of transaction costs, concluding the importance of institutions in the functioning of societies. Finally, adding the theory of production he can clarify the role of institutions in economic performance. With regard to the theory of human behavior, the asymmetry of information about the behavior of both parties in a process of exchange, triggers uncertainty about the proper observance of the rights and duties adjacent to each other. In order to reduce uncertainty, institutions arise, formally and informally, to ensure the proper functioning of the exchange process. According to North (1990, p.27), "*the costliness of information is the key to the costs of transacting, which consist of the costs of measuring the attributes of what is valuable being exchanged and the costs of protecting rights and policing and enforcing agreements".* Thus, transaction costs reflect the degree of uncertainty that exists, or otherwise the share of institutions in society, by including a risk premium. The risk premium will be greater, the lower the ability of a society to ensure the enforcement of contracts and protection of property rights. Institutions affect the total production costs, by transaction costs as much as the transformation costs. Transformation costs of inputs of land, labour, capital and goods and services, in a production process can be affected by the quality of institutions. The quality of institutions determines the application of contracts, the enforceability of rights and duties, measurement and uncertainty in the markets. Therefore determines the efficiency of production by the quality of inputs provided, the amount of inputs required, the time to affect, among other

aspects of the production process. This is how North argues the effect of institutions on transformation costs. According to North (1990), the weight of institutions in production costs affects profits, and as such the country's attractiveness for foreign investment (FDI inflows). The consequences on the quality of institutions may go much beyond influencing production costs. Henisz and Williamson (1999) and Henisz (2000) argue that the lack of protection of property rights in a country may lead to expropriation risk, direct hazard (nationalization of the company) or indirect hazard (favoritism by the government).

2.2. Empirical evidence review

The nineties were signaled by the intensified flows of FDI, also accompanied by an increased interest of developing countries in attracting greater flows. The need of a country to become more competitive triggered a demand for the most important factors in deciding the investment location. Studies have begun to demonstrate that foreign investors were taking greater account on the business environment of a country, which is its institutional quality, than the arrest of "natural assets" (Bevan, Estrin et al. 2004). The North's study (1990) comes in that sense too, showing the importance of institutions on economic performance. His research work marked the big push for the remaining studies in this area.
Although there is strong evidence that a good institutional environment is more attractive to FDI, the empirical results are unclear and even controversial (Lim, 2001). Blonigen (2005) concludes that the mixed results stem from conceptual problems, measures and methods used. *Estimating magnitude of the effect of institutions on FDI is difficult because there are not any accurate measurements of institutions* (Blonigen, 2005, p. 390).
A summary of what has been discovered in recent empirical studies is essential for the understanding of all potential determinants of FDI. Specifically in order to identify the institutional areas most studied, and therefore bring together the different conclusions about its significance for FDI. The initial focus of empirical studies on FDI was on economic determinants. Market size, degree of openness, cluster, proximity, level of industrialization, agglomeration economies, level of infrastructure, currency depreciation have a positive and significant relation with FDI. Contrary to taxes, labor costs and education, that demonstrates a negative impact on FDI. The most robust relation is with market size (Lim, 2001). However, the results are not consensual among several authors

concerning their impact on FDI. Chakrabarti (2001) argues that most factors of cross-country FDI are sensitive statistically.

The growing economic relationship between countries and agreements among themselves, triggered greater movement of goods, people, capital and services. It is in this context that the concern with the quality of institutions arises, as weighting factor of where to invest and as a competitive factor in attracting FDI. The majority of the empirical studies claim that the quality of institutions has a significant impact on FDI. Schneider and Frey (1985) were among the first empirical studies to present a negative impact of political instability on FDI. A more recent study states that government stability is extremely significant in order to catch FDI, as well as the absence of conflicts, tensions and the guarantee of democracy (Busse and Hefeker, 2007). Li and Resnick (2003) argue that democracy affects FDI positively, once it reinforces property rights. Aizenman and Spiegel (2002) set a positive relationship between property rights and FDI, claiming that strong enforcement of property rights increases the share of FDI in total investment. Lee and Mansfield (1996) present one of the first empirical studies about the relationship between a developing country's system of intellectual property protection and FDI, concluding that has influence in volume and in composition of FDI. FDI inflows are affected positively by a reliable legal system with less corruption (Asiedu, 2005). Campos and Kinoshita (2003) also state a positive and significant relation between rule of law and FDI.

Nevertheless, some studies do not reach the same conclusions. Noorbakhsh, Paloni et al. (2001) do not find a significant effect of democracy and political risk on FDI. Government stability and bureaucratic quality do not have a significant relationship with FDI according to Kolstad and Tondel (2002). Jensen (2003) find that government reputation, expropriation, corruption, rule of law and bureaucratic quality have insignificants effects on FDI.

The latter results question the significance of the institutional variables and therefore the robustness of the results. But this controversy may be due to problems with the sample used in the study and to measurement problems (inappropriate measures) (Blonigen, 2005). Studying quality of institutions makes more sense in developing countries, since they have large discrepancies between them and some of them a poor institutional quality. Thus, it is pertinent to analyze the different impacts on FDI. While the quality of institutions in developed countries presents more homogeneous (Blonigen, 2005).

3. FDI and the Institutional Determinations of Doing Business

3.1. Research question

The main questions we would like to answer in this work are if institutional indicators of Doing Business report explain the worldwide differences in attracting FDI; what is their relationship; which are the areas most significant in attracting FDI; and if the conclusions are the same between advanced economies and developing countries.

3.2. Model description

The importance of quality of institutions in affecting the FDI in a country can be verified through the empirical analysis that follows, which analyze the relationship between the institutional indicators of the international report of Doing Business and the inward FDI stock for each country.

Consider the following panel data model:

$$y_{it} = c_i + \sum_{s=2}^{T} d_s \alpha_s + x'_{it}\beta + \varepsilon_{it}$$

where the subscript i = 1, 2, …, N designates countries, the subscript t = 1, 2, …, T. The scalar α and vector $\beta_{[k\times 1]}$ are parameters to be estimated. And, ε_{it} is an i.i.d. error term which is assumed normally distributed.

For each country i, y_{it} corresponds to the observations of the dependent variable. The dependent variable y_{it} is the natural logarithm of inward FDI stocks. Most empirical studies in this area use the logarithm of FDI to evaluate the impacts in terms of elasticities or semi-elasticities, and because it provides a better fit. On the other hand the use of FDI stocks are preferable to flows in a way that they are less volatile, and more relevant to analyze the role of institutions. In fact stocks are based on past accumulated flows which permit that specific year investments not influenced as flows are (Bénassy-Quéré, Coupet and Mayer, 2007). In this sense stocks constitutes a better measure to evaluate the

relevance of institutional variables of Doing Business in FDI. Finally FDI stocks eliminates the possibility of negative values, and as such increases the number of observations which may be estimated.

The c_i represents the idiosyncratic effects, which catches all specific individual characteristics of the host country that are important to the amount of inward FDI.

The world movement of FDI along years has a trend, but this pattern can suffer a regime shift. So we introduce time dummies in the present model, denoted by d_t.

Column vector $x'_{it\,[1\times k]}$ contains the observations of the k explanatory variables. The explanatory variable x'_{it} is a set of indicators of institutional quality[9] and economic control variables. Institutional indicators were chosen from Doing Business, the international report that we pretend to study. Control variables, are composed by the host country's Log of Gross Domestic Product (in current USD), Log of Gross Domestic Product per capita (in current USD), Gross Domestic Product growth and Openness. GDP is used to catch the impact of market size of the host country. GDP per capita is a proxy to purchasing power of consumers and is a proxy of real wages too (Bénassy-Quéré, Coupet and Mayer, 2007). GDP growth rate is a proxy for market growth (Bevan and Estrin, 2004). Market size and growth can be considered one of the reasons in catching or not new investors (Resmini, 2000). Openness - the share of imports plus exports over GDP - measures the level of trade, meaning the degree of liberal trade regime (Resmini, 2000). Market size and trade openness seems to be the more robust determinants of FDI, as argued by Chakrabarti (2001) and Moosa and Cardak (2006) respectively.

These were the chosen variables considered in the literature as the most relevant and robust. Moreover the objective of the present study is to concentrate the analysis on Doing Business' institutional determinants. Doing Business' database it is already ample, catching different institutional areas.

3.3. Data

The empirical analysis is based on 177 countries, which 33 are advanced economies and 144 are developing countries, covering 2004-2009 period. The choice of countries and also the period covered are determined by the availability of Doing Business' data, UNCTAD's data, WDI's data and in according with classification of countries by FMI.

[9] Detailed description on data section and in appendix 1.

Concerning the purpose of this study, the principal database is Doing Business[10]. From the 183 countries, 6 were eliminated. Marshall Islands, Micronesia, Palau, Puerto Rico and West Bank and Gaza are not classified by FMI as advanced economies or developing countries. Kosovo was excluded once there is no availability of economic variables.

The dependent variable, inward FDI stocks, was obtained on UNCTAD database. All control variables, GDP, GDP per capita, GDP growth and openness were obtained on World Development Indicators 2012.

Table 1: Advanced and Developing Countries

Advanced economies	Developing economies
Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong SAR, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Taiwan Province of China, United Kingdom, and United States.	Republic of Afghanistan, Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Armenia, Azerbaijan, The Bahamas, Bahrain, Bangladesh, Belarus, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Chile, China, Colombia, Comoros, Democratic Republic of Congo, Republic of Congo, Costa Rica, Côte d'Ivoire, Croatia, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Ethiopia, Fiji, Gabon, The Gambia, Georgia, Ghana, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Islamic Republic of Iran, Iraq, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyz Republic, Lao People's Democratic Republic, Latvia, Lebanon, Lesotho, Liberia, Lithuania, Former Yugoslav Republic of Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nepal, Nicaragua, Niger, Nigeria, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Qatar, Romania, Russia, Rwanda, Samoa, São Tomé and Príncipe, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Solomon Islands, South Africa, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Sudan, Suriname, Swaziland, Syrian Arab Republic, Tajikistan, Tanzania, Thailand, Democratic Republic of Timor-Leste, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Republic of Yemen, Zambia, and Zimbabwe.

According with Bénassy-Quéré, Coupet and Mayer (2007) the impact of GDP per capita is unclear. In general, studies show that its impact is positive on inward FDI, but not always significant. This happens once GDP per capita induces two distinct potential effects. Indeed, GDP per capita is a proxy to purchasing power of consumers and is a proxy of real wages too. GDP and GDP growth as proxies to market size and to market potential growth are a way to understand the product demand and the capacity to supply. Thus, we expect coefficients to be positive (Bevan and Estrin, 2004). These expected relationships are confirmed in correlation matrix[11]. FDI has a strong positive correlation with GDP and with GDP per capita. Relatively to openness variable, Bevan and Estrin (2004, p.778) claims that should be positively related with FDI. Since openness reveals the degree of trade liberalization, a higher degree attracts more multinational firms.

[10] Database obtained in Doing Business' site: www.doingbusiness.org.
[11] Table 2.1 in appendix 2.

Concerning institutional variables of Doing Business' report, it constitutes a vast set of information on business regulations, covering 9 different areas (33 variables) – Starting a business, dealing with construction permits, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and closing a business. In order to easier interpretations and comparisons, the information of the 33 variables was summarized into these 9 categories. In a first step, all the 33 variables were transformed to indexes, through the min-max standardization method. At a second step these indexes were grouped in their respective categories. One great advantage is to provide a consistent measure for evaluating each area of institutional quality of potential host countries. All institutional indicators range from 0 to 10. Higher values always mean better performances. An important aspect to note is that each report of the Doing Business refer the facts of the previous year, thus the 2007 report for example refers to data from June 1, 2006. The database of the present analysis already takes into account this situation, so the data on institutional variables reflect the exact year information. The empirical theory turns out that the quality of institutions positively influences the flow of FDI. So the expected relationship between FDI and institutional variables is positive. Correlation matrix (Table 2.1 in appendix 2) demonstrates exactly that there is a relatively strong correlation between FDI and all categories of business regulations.

Table 2: Abbreviations

Abbreviation	Description
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GDPpc	Gross Domestic Product per capita
GDPgrowth	Gross Domestic Product growth rate
Openness	Degree of Openness
Startbusi	Starting a Business
Construct	Dealing with construction permits
Property	Registering a property
Credit	Getting Credit
Investors	Strength of investor protection
Taxes	Paying Taxes
Trade	Trading across borders
Contracts	Enforcing contracts
Close	Closing a Business
Global	Simple average of the 9 institutional areas

Table 3: Descriptive statistics of the variables used in benchmark[12]

Variable	Obs	Mean	Std. Dev.	Min	Max
gdppc	1231	10356.39	16044.02	8700446	118218.80
gdpgrowth	1229	4488665	5246471	-41	46.50
gdp	1231	280000000000	1130000000000	93500000	14300000000000
openness	1159	0.93	0.52	0.22	4459112
fdi	1239	77600000000	267000000000	0	3600000000000
startbusi	1169	9048817	0.49	6249659	9999844
construct	867	8765996	0.67	4758733	9880703
property	1009	8002185	0.92	2780887	9800431
credit	950	306902	1898603	0	8541389
investors	872	4981737	1547974	1	9675
taxes	872	8339218	0.93	334421	9896508
trade	872	7416478	141693	2055012	952717
contracts	1163	6659497	1248758	0.39	9636438
close	1079	6284229	1564722	1805556	9782529
global	758	7004165	0.80	5101769	9061121
lngdp	1231	2378607	2370508	1835366	3029106
lngdppc	1231	8092422	1623244	446596	1168029
lnfdi	1220	2257902	2443434	1601642	2891109

3.4. Estimation procedure

The purpose of this empirical study is to explore the relationship between institutional indicators of Doing Business*'* report and inward FDI stock.

The appropriate estimation method to explore this relationship will depend on specific characteristics of countries, on the error term and on the independent variables, as well as on the relation between them (Rodríguez and Pallas, 2008). The estimations are carried out using the Stata/SE 10.0. There are some unobservable country-specific characteristics that lead to different nature of FDI and different amounts of inward FDI stock, which can cause problems of endogeneity (a common implication of using panel data). This means that each country has individual-specific effects time-invariant triggering correlation with regressors. And this is the key assumption that makes fixed-effects estimator necessary[13]. Concerning others estimators, for example first differences estimator is less efficient (in weak terms) than fixed effects and so in general it is not applied. In turn between estimator is only used in very specific situations and in contrast with fixed effects it is inconsistent if the fixed

[12] The variables are defined in appendix 1.

[13] Cameron, A. and Trivedi, P. (2005). Microeconometrics, Methods and Apllications. Cambridge University Press.

effects model is the true model. On the other hand, pooled ols does not determine a specific effect and then is inconsistent once the fixed effects model is appropriate. Finally, Hausman test[14] leads us to choose fixed effects estimator as the consistent estimator, against random effects. Therefore, fixed effects model is the true model, fixed effects is consistent and random effects is inconsistent. Despite the fact that, random effects is always more efficient. The fixed-effects estimator assumes that explanatory variables are strictly exogenous conditional on the unobservable term time-invariant. In order to ensure that the FE estimator is well behaved asymptotically, we need a standard rank condition on the matrix of time-demeaned explanatory variables: $rank((X)'\ddot{X}) = K$. Consequently the fixed effects estimator can be shown to be unbiased conditional on explanatory variables. Towards the maximum efficiency possible of this estimator, a further assumption is needed. That is idiosyncratic errors to have a constant variance across time and to be serially uncorrelated[15]. The potential heterogeneity between countries suggests that we should estimate with robust standard deviations.

Summarizing the 33 variables in 9 categories or by concentrating all 9 categories in only one variable called global, leads us to gain in robustness of the results. Nonetheless empirical literature argue that this type of aggregation has a great disadvantage, in sense that is too broad once correlations between institutional variables are high (Júlio, Pinheiro-Alves and Tavares, 2011).

Countries with different levels of development certainly have specific patterns of FDI, so it makes sense to run a regression to each group of countries, apart from the joint regression. In the case of the present analysis two groups, the advanced economies and the developing countries. This way we can have a first idea of the differences in the explanation of FDI in advanced economies and in developing countries.

Probably the variance in attracting FDI is not the same for advanced economies and developing countries. Thus we are dealing with testing for differences in regression functions across groups. Interacting dummy variables with other independent variables is the tool to test these differences. Interaction dummies permit to test whether the attraction of FDI to advanced economies and to developing countries is described by the same regression model. Thus it is necessary to define a dummy that is equal to zero in the case of a developing country and equal to one in the case of an advanced economy.

[14] Hausman test in figures 3.25 and 3.26 on the appendix 3.

[15] Chapter 10. Wooldridge, J. (2002). Econometric Analysis of Cross Section and Panel Data, MIT Press, Cambridge.

To the case of interacting dummy variables, the model to be estimated is the following:

$$Ln\ FDI_{it} = c_i + \sum_{s=2}^{T} d_s \alpha_s + \beta_1\ GDP_{it} + \beta_2\ GDP\ pc_{it} + \beta_3\ GDP\ growth_{it} + \beta_4\ openness_{it} + \beta_5\ startbusi_{it} + \beta_6\ construct_{it} + \beta_7\ property_{it} + \beta_8\ credit_{it} + \beta_9\ investors_{it} + \beta_{10}\ taxes_{it} + \beta_{11}\ trade_{it} + \beta_{12}\ contracts_{it} + \beta_{13}\ close_{it} + \delta_1\ dummy * startbusi_{it} + \delta_2\ dummy * construct_{it} + \delta_3\ dummy * property_{it} + \delta_4\ dummy * credit_{it} + \delta_5\ dummy * investors_{it} + \delta_6\ dummy * taxes_{it} + \delta_7\ dummy * trade_{it} + \delta_8\ dummy * contracts_{it} + \delta_9\ dummy * close_{it} + \varepsilon_{it}$$

It is a model where the intercept and all slopes can be different across the two groups. We are going to test the null hypothesis, *i.e.*, if inward FDI stocks follows the same regression model for developing countries and for advanced economies, stated as:

$$H_0 : \delta_1 = 0 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = \delta_8 = \delta_9$$

This is tested against the alternative:

$$H_a: \delta_1 \neq 0 \vee \delta_2 \neq 0 \vee \delta_3 \neq 0 \vee \delta_4 \neq 0 \vee \delta_5 \neq 0 \vee \delta_6 \neq 0 \vee \delta_7 \neq 0 \vee \delta_8 \neq 0 \vee \delta_9 \neq 0$$

Lastly, the question is if FDI depends on institutional quality of the last period. Thus we are going to carry out a new estimation, in which the institutional variables are lagged one year. Indeed Bevan and Estrin (2004) argue that the process of deciding and realizing investments abroad is time consuming, *i.e.*, FDI flows do not occur at the same time decisions have been made. Following this idea, if explanatory variables change such as institutional variables, FDI reacts but with a temporal lag. In conclusion, inward FDI stocks analyzed here could represent a decision made on past levels of institutional quality. Therefore it is worth to estimate the model with a one-year lag for the independent variables in the four cases (individual, all variables, global and interaction variables).

Consider the following panel data model in the lagged form of the base model:

$$y_{it} = c_i + \sum_{s=2}^{T} d_s \alpha_s + x_{1it}'\beta_1 + x_{2i(t-1)}'\beta_2 + \varepsilon_{it}$$

Where x_{1it} represents the control variables and the $x_{2i(t-1)}$ the one-year lagged institutional variables.

3.5. Results

The econometric analysis was carried out in several stages. In the first stage, the model is estimated only with the economic variables (Column 1 of table 4). In the second stage, institutional dimension is added to the model by the global index (Column 2 of table 4) and in another stage by 9 institutional indexes (Column 3 of table 4). In the fourth stage, the objective is to relativize the results by the level of development (Table 6). Fifth stage presents the results of introducing interaction dummies variables (Table 7). Finally, in the sixth stage results of model in one-year lag are presented (Table 8).

The following tables contain the results of estimations, which are all based on fixed-effects model for the reasons previously presented. On the various attempts to estimate the model, it was found that the time dummy variables reveal most of the time to be significant at the 1% level.

3.5.1. Economic determinants of FDI

GDP is clearly statistically significant in attracting FDI, even when institutional variables are added the overall sign and significance does not reveal striking differences. The positive coefficient and its significance strengthen the theoretical hypothesis of GDP as a proxy for market size. According to column (1) of table 4, an increase of 1% in the GDP of a host country increases FDI in 0.9%.

The effect of GDP per capita is in general insignificant and negative. Nevertheless, when estimating the model only with economic determinants, GDP per capita shows a significant impact on FDI. GDP per capita can be seen as a signal of real wages and as such labor

costs. In this sense a higher GDP per capita could mean an increase in labor costs, which constitutes a lower attractiveness of the host country.

Unlike the GDP per capita, GDP growth reveals significance only when the regression includes the institutional variables. Furthermore its impact on FDI is positive only regressing with institutional variables too.

Lastly, openness is also statistically insignificant in the first regression. In the following regressions with global and then with the all institutional variables, openness is generally significant and has positive sign, as expected. Taking in account the results of column (2) of table 4, an increase by 1 percentage point (p.p.) on the degree of openness, rise inward FDI stocks around 27%[16].

3.5.2. Institutional determinants of FDI

The results are presented in Table 4 and Table 5. The overall Doing Business index, global, demonstrates economically meaningful effect on FDI, given its statistical significance at 1% and the positive coefficient. In fact, an increase in one point in the global index (in a 0-10 scale) fosters inward FDI stocks around 47% (column (2) in table 4). This means that countries with high quality institutions that guarantee the protection of property rights constitute a focus in attracting FDI. Column (3) of Table 4 presents the results for the case that the global index is disaggregated in all 9 indexes respectively to their categories. This estimation provides a more specific analysis, showing which institutional area has a stronger and weaker impact on FDI. Specific analysis is enriched if we run a regression to each institutional variable individually. These results are presented in Table 5, and only the coefficients for the institutional indicators are presented once they are the focus of the analysis. The variables are arranged according to their increasing explanatory power of Log FDI (R^2). The interpretation of the coefficients of the institutional variables now requires special attention, they cannot be interpreted in the same way as economic determinants. The impact on the variation of FDI comes from a range of 0 to 10 points.

[16] The marginal effects are interpreted using the formula $\exp(\hat{\beta}) - 1$, where $\hat{\beta}$ is the estimated parameter.

Table 4: Regression Results

	(1)	(2)	(3)
Ln Gdp	0.892***	0.778**	0.555*
	(0.248)	(0.356)	(0.311)
Ln Gdppc	-0.443*	-0.500	-0.331
	(0.253)	(0.342)	(0.304)
Gdp growth	-0.001	0.006*	0.006**
	(0.003)	(0.003)	(0.003)
Openness	0.203	0.242**	0.267**
	(0.129)	(0.121)	(0.115)
Institutional variables			
Global		0.388***	
		(0.075)	
Startbusi			0.276***
			(0.086)
Construct			-0.130**
			(0.064)
Property			0.110***
			(0.034)
Credit			0.023
			(0.022)
Investors			-0.050*
			(0.027)
Taxes			0.111*
			(0.064)
Trade			0.116***
			(0.031)
Contracts			-0.027
			(0.094)
Close			0.082*
			(0.050)
No. Of obs.	1143	709	709
R^2			
within	0.6964	0.6912	0.7166
between	0.6632	0.6794	0.7588
overall	0.6690	0.7024	0.7645
Wald χ^2 / F	F(10,963)=186.12	F(9,542)=117.56	F(17,534)=69.31

Note. The parentheses contain the robust standard errors. * Significance at the 10% level. ** Idem., 5%. * Idem., 1%. Coefficients for time dummies and constant are omitted.

Crossing the joint estimation results in column 3 of Table 4 with those of the individual estimation of Table 5 we can draw some interesting aspects. Individual estimations report a positive effect on FDI by all institutional variables. However, protecting investors and construction permits are insignificant in explaining FDI. The most relevant factors (1% significance level), according to individual estimations, are starting a business, registering property and trading across borders. When all variables are estimated jointly, construction permits, protecting investors and enforcing contracts reveal a negative impact on FDI contrary to individual estimate. Furthermore, getting credit and enforcing contracts are no longer significant in attracting FDI. Even more interesting is the fact that construct permits and protecting investors become significant. However, the joint estimation reinforces the previous result with regard to the most relevant factors.

Table 5: Regression results – individuals' significance

	(1)	Rob.Stand.Errors	R^2
Global	0.388***	(0.075)	0.7024
Contracts	0.342***	(0.104)	0.8250
Startbusi	0.270***	(0.053)	0.8069
Close	0.077*	(0.042)	0.8021
Trade	0.136***	(0.032)	0.7773
Property	0.121***	(0.033)	0.7488
Credit	0.058**	(0.024)	0.7487
Investors	0.014	(0.027)	0.7155
Construct	0.035	(0.072)	0.6854
Taxes	0.142**	(0.064)	0.6821

*, ** and *** represent rejections at 10, 5 and 1 percent significance levels, respectively. Coefficients for control variables are omitted.

Thus the factors that most influence the level of inward FDI are, in particular, the number of procedures, the costs and the time required to start a business and to registry a property; and also the procedural requirements for exporting and importing. For instance, a one point increase on starting a business performance leads to an increase in FDI around 32%, according to joint estimation. If registering a property or trading across borders improves their performance in one point, FDI is fostered in 12%. These impacts are slightly different to the individual estimates. Also the number of taxes, time to pay taxes, total tax rate and time, cost and recovery rate to close a business represents a statistically contribution in explaining the variability of the FDI in both two previous estimations (around 12% and 9%

respectively to the mentioned areas). With respect to getting credit and enforcing contracts, we can concluded that individually are important in the uptake of the FDI, however, when compared to remaining institutional areas are not so critical in the choice of location of investment.

The Wald test proves all the significances of the institutional variables to both estimations.[17]

3.5.3. Two separate regressions:

The question that arises now is whether there are differences in explaining FDI by institutional variables of Doing Business when the host country is an advanced economy and when the host country is a developing country. In this sense, at a first step two distinct regressions are estimated. The results are presented in Table 6.

A first conclusion that arises immediately is that the results presented above apply to developing countries. Both in terms of significance and in terms of coefficients conclusions remains relatively the same, except closing the business that is no longer statistically significant in the explanation of FDI.

Concerning an advanced economy, in general none of institutional factors of Doing Business is relevant to inward FDI (Column (2) in Table 6). Column (3) presents the specific effect of institutional variables. Analyzing at this level of specification, starting a business is the only institutional area that condition catchment of FDI. The performance of institutions loses importance in the decision of investors, when the target country is an advanced economy.

In terms of economic determinants, we can establish a pattern. In the case that target country it is a developing country, matters the potential of market growth and secondly its openness. Investment in an advanced economy will depend on the degree of openness, once it reveals the ability to trade of that country.

[17] Provided in the appendix 3.26 and 3.27.

Table 6: Regression results – Relativizing results by level of development

	(1)		(2)		(3)	
	Developing	Advanced	Developing	Advanced	Developing	Advanced
Ln Gdp	0.735***	1.399	0.412	1.059	0.171	1.124
	(0.275)	(1.071)	(0.391)	(1.013)	(0.367)	(1.049)
Ln Gdppc	-0.380	-0.649	-0.310	-0.192	-0.105	-0.284
	(0.273)	(1.081)	(0.368)	(0.997)	(0.350)	(1.075)
Gdp growth	-0.001	-0.003	0.005*	-0.005	0.006*	-0.002
	(0.003)	(0.007)	(0.003)	(0.006)	(0.003)	(0.006)
Openness	0.189	0.278*	0.307**	0.234	0.339**	0.305*
	(0.146)	(0.153)	(0.144)	(0.175)	(0.135)	(0.169)
Institutional variables						
Global			0.393***	-0.250		
			(0.077)	(0.177)		
Startbusi					0.259***	0.255**
					(0.092)	(0.100)
Construct					-0.129	-0.011
					(0.081)	(0.085)
Property					0.111***	-0.020
					(0.036)	(0.068)
Credit					0.025	-0.036
					(0.023)	(0.069)
Investors					-0.063**	0.134
					(0.028)	(0.089)
Taxes					0.122*	-0.141
					(0.064)	(0.185)
Trade					0.142***	-0.104
					(0.031)	(0.066)
Contracts					-0.015	-0.055
					(0.111)	(0.126)
Close					0.093	-0.022
					(0.066)	(0.038)
No. Of obs.	919	224	558	151	558	151
R^2						
within	0.6952	0.7506	0.7007	0.7670	0.7333	0.7907
between	0.6085	0.7220	0.6562	0.7165	0.5299	0.7463
overall	0.6209	0.7171	0.6510	0.7157	0.4613	0.7523
Wald χ^2 / F	F(10,771)=145.99	F(10,182)=78.65	F(9,423)=99.23	F(9,110)=36.35	F(17,415)=63.31	F(17,102)=28.25

Note. The parentheses contain the robust standard errors. * Significance at the 10% level. ** Idem., 5%. * Idem., 1%. Coefficients for time dummies and constant are omitted.

3.5.4. Interacting Dummy Variables

The introduction of interacting dummy variables reveals the differences in regressions for both groups of countries. The results are presented in Table 7.

Regarding the results of column (1) the contribution of global variable to FDI of developing countries is around 51%, at a significant level of 1%. The coefficient of "dummy_global" variable represents the difference of contribution of global institutional variable to FDI between developing countries and advanced economies. So the impact of global index in FDI of an advanced economy is equal to – 0.301 = 0.409 – 0.710, *i.e.*, (-30%). Computing the exact percentage, one point increase in general performance of institutions leads to a decrease in inward FDI stocks of advanced economy around 26%, and it is significant at 1%level. The difference between the two groups of countries in terms of attracting FDI is – 0.710, a difference significant at 1% level. So the first conclusion is that there is evidence that the contribution of global index to FDI it is not the same among developing countries and advanced economies.

Detailing the results and the differences in institutional areas (column (2) in Table 7) we can achieve more conclusive ideas. The institutional determinants that have more explanatory power in attracting FDI to developing countries are starting a business, registering property, protecting investors, paying taxes and trading across borders. All institutional variables have different effects in contributing to FDI in advanced economies, relatively to the effects in developing countries. These differences are given by the coefficients of interaction variables. Nevertheless, they are not all statistically significant. Only two institutional areas present significant differences in the impact of FDI between the two groups of countries. The two significant (at 5% level) differences in attracting FDI to advanced economies, in relation to developing countries, are in contribution of protecting investors and trading across borders.

The contribution of protecting investors to FDI of developing countries is around – 6%. On the other hand, FDI of advanced economy increase around 13% if protecting investors increase one point (difference from developing country about 20%). The difference in attracting FDI by an increase of one point in trading across borders, between the two groups, is about – 17%. It leads to a decrease of FDI in advanced economies around 5% and to foster inward FDI in developing countries in about 15%.

Table 7: Regression results – Interaction variables

	(1)	(2)
Ln Gdp	0.616*	0.364
	(0.351)	(0.324)
Ln Gdppc	-0.377	-0.180
	(0.336)	(0.315)
Gdp growth	0.005*	0.006**
	(0.003)	(0.003)
Openness	0.247**	0.281**
	(0.120)	(0.114)
Institutional variables		
Global	0.409***	
	(0.074)	
Startbusi		0.269***
		(0.091)
Construct		-0.127
		(0.080)
Property		0.110***
		(0.036)
Credit		0.030
		(0.023)
Investors		-0.061**
		(0.028)
Taxes		0.126*
		(0.064)
Trade		0.136***
		(0.031)
Contracts		-0.028
		(0.112)
Close		0.086
		(0.067)
dummy_Global	-0.710***	
	(0.200)	
dummy_Starbusi		0.031
		(0.129)
dummy_Construct		0.016
		(0.123)
dummy_Property		-0.093
		(0.101)
dummy_Credit		-0.144
		(0.094)
dummy_Investors		0.180**
		(0.086)
dummy_Taxes		-0.279
		(0.194)
dummy_Trade		-0.186**
		(0.091)
dummy_Contracts		-0.031
		(0.161)
dummy_Close		-0.011
		(0.091)
No. Of obs.	709	709
R^2		
within	0.6954	0.7265
between	0.0340	0.0454
overall	0.0361	0.0456
Wald χ^2 / F	F(10,541)=109.26	F(26,525)=54.40

Note. The parentheses contain the robust standard errors. * Significance at the 10% level. ** Idem., 5%. * Idem., 1%. Coefficients for time dummies and constant are omitted.

According to F statistic, null hypothesis is rejected with a p-value equal to zero to five decimal places,

$$H_0 : \delta_0 = 0 = \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = \delta_8 = \delta_9$$

This means that advanced and developing countries do follow different explanatory models, relatively to the effect of Doing Business' institutional variables in FDI. Even though a great number of interaction variables be insignificant at the 10% level.

3.5.5. Lagged form of the base model

Table 7 presents the results to the case that the dependent variable depends on one-year lag institutional variables.

The results presented in column 1 of Table 7 tell us that in general the institutional quality of a country in the year preceding analysis explains the direction of inward FDI of the year analyzed. For instance, a one point increase in global variable leads to an increase in FDI around 29%, which is significant at 1% level. More specifically, starting a business and trading across borders are significant in explaining FDI based on preceding year.

Moreover when the choice to invest in a country is based on information from the previous year, the factors that are always served are the GDP and GDP per capita. That is, it is considered at all times the size of the market as well as their labor costs.

Nevertheless, the contemporaneous model is more robust, since it has a great explanatory power (R^2). Indeed, almost of institutional areas of Doing Business have explanatory power to FDI, only in the case they are contemporaneous with FDI. This means that FDI depends more on contemporaneous institutional quality, then in previous conditions.

In fact, concerning the period analyzed, the investment decision process is faster, second institutions record major changes and the access to information are larger and faster. So it is natural that the inward FDI is explained by contemporaneous institutional situation.

Table 8: Regression results – Lagged form

	(1)	(2)
Ln Gdp	1.326***	1.140***
	(0.446)	(0.383)
Ln Gdppc	-0.917**	-0.774**
	(0.413)	(0.355)
Gdp growth	0.005	0.005
	(0.004)	(0.004)
Openness	0.066	0.066
	(0.117)	(0.119)
Institutional variables		
Global	0.253***	
	(0.090)	
Startbusi		0.191**
		(0.078)
Construct		-0.098
		(0.090)
Property		0.009
		(0.037)
Credit		0.011
		(0.025)
Investors		-0.026
		(0.035)
Taxes		0.078
		(0.050)
Trade		0.081***
		(0.031)
Contracts		0.127
		(0.118)
Close		0.067
		(0.041)
No. Of obs.	553	553
R^2		
within	0.6100	0.6288
between	0.5498	0.6121
overall	0.5688	0.6349
Wald χ^2 / F	F(8,393)=57.63	F(16,385)=32.03

Note. The parentheses contain the robust standard errors. * Significance at the 10% level. ** Idem., 5%. * Idem., 1%. Coefficients for time dummies and constant are omitted.

4. Conclusion

This study plays an important role in improving the business environment, in institutional terms. Indeed, the growing importance of FDI as an engine of economic growth triggers by each country a greater concern for their business environment. Moreover empirical studies prevails the positive influence of a good institutional quality in the promotion of investment in general. In this context arises the international report of Doing Business as an instrument of evaluation and reform of business environment. However, there is no empirical literature showing a relationship between the indicators of Doing Business and inward FDI. The purpose of this study was to verify that relationship. In other words it was to analyze if the difference in functioning of the institutions among countries, based on the Doing Business' indicators, explains the difference in levels of foreign direct investment between countries. Furthermore, see if this relationship was the same for advanced economies and developing countries. Finally, was to identify the areas whose focus should be higher, given their higher significance.

This analysis covered 33 advanced economies and 144 developing countries to the 2004-2009 periods. Overgrown 9 institutional areas of international report of Doing Business and the most important economic determinants of FDI.

The first main conclusion is that in general, a country rated with a better business environment performance is likely to collect larger amounts of FDI. Under different model specifications and joining the most important determinants variables, institutions appear to have a great impact on FDI. Hence, institutional quality plays a robust role in determining FDI.

In particular, all procedures required in order to start a business, to registry a property, to trade across borders, to close a business and to pay taxes are the institutional factors that most contribute on attracting FDI.

The second major conclusion is that advanced and developing countries do not follow the same explanatory models. The institutions are important when the decision to invest is among developing countries. In case the host country is an advanced economy, institutional quality loses relevance in explaining inward FDI. In fact, the functioning of the institutions among advanced economies is very similar that investors meet other pull factors that distinguish the advanced economies, contrary to the developing countries.

The third insight we can draw from this study is that the international report of Doing Business is a good indicator of the ability to attract FDI to developing countries. Thus a useful tool for political reform.

4.1. Policy implications

The conclusions obtained of the relationship between institutional indicators of the business environment and the caught amount of FDI allows us to draw some guidelines for policy reform. Institutional areas that have greater significance in determining FDI are probably those whose reform will have a greatest impact in attracting a greater amount of FDI. They are starting a business, registering property, paying taxes, trading across borders and closing a business.

Doing Business as an "observer" of the business environment of 183 countries, gathers all the operational practices of the institutions and the reforms carried out from year to year. Moreover publish it in its annual report, allowing all countries to know in detail the various business environments and the various policy reforms taken. Thus, many economies have the opportunity to learn from the experience of others. In this sense, the Doing Business provides a selection of good practices adopted worldwide in order to serve as a guide of reforming the functioning of the institutions for a better business environment.

Based on the suggestions to good practice in the Doing Business report, we can outline policy recommendations by institutional area. Concerning the process of starting a Business, the good practices recommended are to reduce or eliminate the minimum capital requirement, create a single interface (or a one stop-shop), state a unique company identification (for example a ID card), online access to the execution of all procedures as well as information, easy access to forms. With respect to registry a property, the practices that should be taken are faster processes, more effective definition of terms, definition of transfer charges fixed, computerize the data about the encumbrances and availability of cadaster information online. Economies can follow good practices in paying taxes if it is allowed to self-assessment, to fill and pay taxes electronically and if there is one tax per tax base. In order to improve the institutional area of trading across borders, Doing Business suggests adopting electronic data interchange systems, to link agencies through an electronic single window, to use risk-based inspections, to raise the regional cooperation, to spark competition and to promote transparency. Resolving insolvency can

operate better if for example special insolvency departments are created in order to be specialized in these cases. Moreover is crucial to establish more efficient processes and greater transparency of the same. And finally guarantee the rights of creditors.

4.2. Limitations and Suggestions for future research

The insights obtained about the importance of institutional areas of the international report of Doing Business in the explanation of foreign direct investment are limited in the sense that may not be applied to one or another particular country, or even at the regional and local level. Each country and each region has its own characteristics that may possibly be more significant in explaining FDI.

As a suggestion, would be very interesting restrict the analysis to developing countries, dividing them into zones such as: East Asia and Pacific, Middle East and North Africa, Eastern Europe and Central Asia, South Asia, Latin America and Caribbean, and Sub - Saharan Africa. Certainly that would be found different relationships of significance of the institutions of different business environments in attracting FDI.

Would be equally important, to estimate the model of the present analysis in dynamic panel, taking into account the fact that institutions are potentially endogenous. Using difference GMM and system GMM estimators.

Finally, the question that arises is the following: reforming institutional areas revealed as significant have great impact on FDI? It would be useful to evaluate institutional reform, for example to the specific case of Portugal.

5. References

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Sites:

- www.doingbusiness.org
- http://unctadstat.unctad.org/
- http://data.worldbank.org/

6. Appendix

Appendix 1: Data description

A.1 Economic variables

The following variables are used.

FDI stock (fdi): Unilateral inward foreign direct investment stocks in US Dollars at current prices. Source: UNCTADStat.

GDP (gdp): Gross Domestic Product in current US Dollars at current prices. Source: World Bank (World Bank Indicators, World Development Indicators (WDI), April 2012).

GDP per capita (gdp pc): Gross Domestic Product per capita in current US Dollars. Source: World Bank (World Bank Indicators, World Development Indicators (WDI), April 2012).

GDP growth (gdpgrowth): Real GDP growth rate (percentage) relative to the previous year. Source: World Bank (World Bank Indicators, World Development Indicators (WDI), April 2012).

Openness (openness): Degree of openness, measured by the ratio of exports (current US Dollars) plus imports (current US Dollars) over GDP (current US Dollars). Source: World Bank (World Bank Indicators, World Development Indicators (WDI), April 2012).

A.2 Doing Business indicators

The World Bank's Doing Business (DB) database measures the level of bureaucracy in a country with regard to doing business. Encompasses a set of 40 indicators, divided into the following 10 areas of analysis: starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and closing a business. For this analysis we used 33 indicators, which were aggregated into nine indexes corresponding to the respective areas and ranging from 0 to 10. To compute these indexes, we proceeded as follows. First, each indicator has become an index, ranging from 0 to 10, according to the min-max standardization method,

$$Score_{\mathrm{k}} = 10\,\frac{factor_{\mathrm{k}} - factor_{\min}}{factor_{\max} - factor_{\min}}$$

If higher factor values imply better performances (*e.g.*, strength of legal rights, recovery rate when closing a business), or

$$Score_{\mathrm{k}} = 10 - 10\,\frac{factor_{\mathrm{k}} - factor_{\min}}{factor_{\max} - factor_{\min}}$$

If higher factor values imply worst performances (*e.g.*, procedures, time, cost).

This was done for 175 of 183 countries from DB database, selected for this analysis. According to this computation, all scores are organized such that higher values always mean better performances. Finally, the topic score is obtained by the simple average of all factors that compose that topic.

An overall doing business index is created by taking the simple average of the 9 topics scores, the "global" variable.

A.2.1 Starting a business (startbusi)

The starting business index measures all procedures that are legally required for an entrepreneur to start up and formally operate an industrial or commercial business. It includes the following variables:

Procedures: Number of all interactions of the company founders with external parties in order to officially start operating a business.

Time: Median number of calendar days that are necessary in practice to complete a procedure with minimum follow-up with government agencies and no extra payments.

Cost: All official fees and fees for legal or professional services if such services are required by law in order to officially complete each procedure to start operating a business. It is recorded as a percentage of the economy's income per capita.

Minimum Capital: Reflects the amount that the entrepreneur needs to deposit in a bank or with a notary before registration and up to 3 months following incorporation in order to start operating a business. It is recorded as a percentage of the economy's income per capita.

A.2.2 Dealing with construction permits (construction)

The dealing with construction permits index measures all procedures required for a business in the construction industry to build a standardized warehouse, and also the costs and time necessary to complete these procedures. It includes the following factors:

Procedures: Number of interactions of the company's employees or managers with external parties that are legally required for building a warehouse, for a business in the construction industry.

Time: Median number of calendar days that is necessary to complete a required procedure.

Cost: All fees associated with completing the procedures to legally build a warehouse. Cost is recorded as a percentage of the economy's income per capita.

A.2.3 Registering property (property)

The registering a property index records the full sequence of procedures necessary for a business man purchase a property from another business man and to transfer the property title to his name, as well as the associated costs and time. It includes the following factors:

Procedures: Number of procedures that are legally or in practice required for a registering property.

Time: Median duration, in calendar days, that property lawyers, notaries or registry officials indicate is necessary to complete a procedure for registering a property.

Cost: All official fees required by law to complete each procedure in order to register a property. This variable is recorded as a percentage of the property value.

A.2.4 Getting Credit (credit)

The getting credit index measures the legal rights of borrowers and lenders with respect to secured transactions and the sharing of credit information. It includes the following factors:

Strength of legal rights: Index that measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. It ranges from 0 to 10.

Depth of credit information: Index that measures rules and practices affecting the coverage, scope and accessibility of credit information available through either a public credit registry or a private credit bureau. It ranges from 0 to 6.

Public registry coverage: Number of individuals and firms listed in a public credit registry with information on their borrowing history from the past 5 years. It is measured as a percentage of adults aged 15 and above.

Private bureau coverage: Number of individuals and firms listed by a private credit bureau with information on their borrowing history from the past 5 years. It is measured as a percentage of adults aged 15 and above.

A.2.5 Strength of investor protection (investors)

The strength of investor protection index measures the strength of minority shareholder protections against directors misure of corporate assets for personal gain. It includes the following factors:

Extent of disclosure: Index which assesses who can approve related-party transactions and the requirements for external and internal disclosure in case of related-party transactions. It ranges from 0 to 10.

Extent of director liability: Index that measures the ability of shareholders to hold the interested party and the approving body liable in case of a prejudicial related-party transaction, the availability of legal remedies (damages, repayment of profits, fines, imprisonment and rescission of the transaction) and the ability of shareholders to sue. It ranges from 0 to 10.

Ease of shareholder suits: Index that measures the documents and information available during trial and the access to internal corporate documents. It ranges from 0 to 10.

A.2.6 Paying taxes (taxes)

The paying taxes index measures the taxes and mandatory contributions that a medium-size company must pay in a given year as well as measures of the administrative burden of paying taxes and contributions. It includes the following factors:

Payments: Records the total number of taxes and contributions paid, including consumption taxes, as well as the method of payment, the frequency of payment, the frequency of filing and the number of agencies involved for this standardized case study company during the second year of operation.

Time: Measures the hours per year taken by company to prepare, file and pay 3 major types of taxes and contributions: the corporate income tax, value added or sales tax, and labor taxes, including payroll taxes and social contributions. It includes the time spent to collect information and to calculate the amount payable.

Total tax rate: Measures all taxes and contributions borne by the business in the second year of operation as a percentage of total profits.

A.2.7 Trading across borders (trade)

The trading across borders index measures procedural requirements associated with exporting and importing a standardized cargo of goods by ocean transport. Such as the time, cost and all documents needed by the trader. It includes the following factors:

Documents to export: Number of all documents required per shipment to export the goods, such as bank documents, customs clearance documents, port and terminal handling documents and transport documents.

Documents to import: Number of all documents required per shipment to import the goods, such as bank documents, customs clearance documents, port and terminal handling documents and transport documents.

Time to export: Time (in calendar days) for exporting a standardized cargo, it is to obtain all documents required for inland transport and handling, for customs clearance and inspections, and for port and terminal handling.

Time to import: Time (in calendar days) for importing a standardized cargo, it is to obtain all documents required for inland transport and handling, for customs clearance and inspections, and for port and terminal handling.

Cost to export: Measures all fees (in US dollars per container) associated with completing the procedures to export a standardized cargo. These include costs of all documentation, inland transport and handling, customs clearance and inspections and port and terminal handling (official costs only, no bribes).

Cost to import: Measures all fees (in US dollars per container) associated with completing the procedures to import a standardized cargo. These include costs of all documentation, inland transport and handling, customs clearance and inspections and port and terminal handling (official costs only, no bribes).

A.2.8 Enforcing contracts (contracts)

The enforcing contracts index measures the efficiency of the judicial system in resolving a commercial dispute. It includes the following factors:

Procedures: Number of procedures resulting from a commercial dispute before the relevant court, required by law or commonly used in practice between the parties or between them and the judge or court officer. It comprises the steps to file and serve the case, steps for trial and judgment and steps necessary to enforce the judgment.

Time: Number of calendar days, from the moment the lawsuit is filed on court until payment. It includes the necessary time to file and serve the case, the time for trial and obtaining judgment and the time to enforce the judgment.

Cost: Measures three types of costs required to complete procedures: court costs, enforcement costs and average attorney fees. It is recorded as a percentage of the claim, assumed to be equivalent to 200% of income per capita.

A.2.9 Closing a business (close)

The closing a business index measures the time, cost and outcome of insolvency proceedings involving domestic entities. It includes the following variables:

Time: Number of calendar days for creditors to recover their credit.

Cost: Measures all fees and costs associated with resolving insolvency. It includes court fees, government levies and fees of insolvency administrations, auctioneers, assessors and lawyers. It is measured as a percentage of the debtor's estate value.

Recovery rate: Measures cents on the dollar recouped by creditors through reorganization, liquidation or debt enforcement proceedings, *i.e.*, the present value of debt that can be recovered.

Appendix 2:

Table 2.1: Covariance Matrix with respect to the variables of the present study

	GDP pc	GDP growth	GDP	Openness	FDIstocks	Startbusi	Construct	Property	Credit	Investors	Taxes	Trade	Contracts	Close	Global
GDP pc	1.0000														
GDP growth	-0.2804	1.0000													
GDP	0.3112	-0.1129	1.0000												
Openness	0.2312	0.0151	-0.1757	1.0000											
FDIstocks	0.4277	-0.1566	0.8844	0.0207	1.0000										
Startbusi	0.4249	-0.2517	0.1001	0.2034	0.2212	1.0000									
Construct	0.2907	-0.1638	0.0629	0.1222	0.1259	0.3162	1.0000								
Property	0.3400	-0.1048	0.1673	0.1630	0.1751	0.3215	0.1450	1.0000							
Credit	0.4929	-0.2534	0.3347	0.0716	0.4014	0.3440	0.2157	0.4512	1.0000						
Investors	0.3213	-0.1371	0.2473	0.1971	0.3200	0.4817	0.2512	0.2455	0.4827	1.0000					
Taxes	0.4366	-0.1433	0.1020	0.2173	0.1872	0.4275	0.2797	0.2866	0.2886	0.3608	1.0000				
Trade	0.5153	-0.2786	0.2125	0.2166	0.2749	0.3908	0.2959	0.3543	0.5316	0.3847	0.3399	1.0000			
Contracts	0.4677	-0.1747	0.2007	0.3027	0.3026	0.4150	0.0981	0.4390	0.4986	0.2438	0.2402	0.3163	1.0000		
Close	0.6095	-0.2246	0.2706	0.1819	0.3672	0.5057	0.2996	0.3263	0.5463	0.4277	0.4461	0.5240	0.5092	1.0000	
Global	0.6601	-0.2898	0.3201	0.2650	0.4282	0.6321	0.4187	0.5802	0.8052	0.6784	0.5737	0.7224	0.6402	0.7947	1.0000

A**ppendix 3:**

Figure 3.1: Stata output of the simple regression for economic variables case

```
. xtreg lnfdi lngdp lngdppc gdpgrowth openness _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =      1143
Group variable: economy                         Number of groups   =       170

R-sq:  within  = 0.6964                         Obs per group: min =         2
       between = 0.6632                                        avg =       6.7
       overall = 0.6690                                        max =         7

                                                F(10,963)          =    186.12
corr(u_i, Xb)  = 0.1414                         Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
      lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .8922859   .2483369     3.59   0.000      .404942    1.37963
     lngdppc |  -.4429749   .2526443    -1.75   0.080    -.9387719     .052822
  gdpgrowth |  -.0006219   .0029286    -0.21   0.832    -.006369    .0051253
   openness |   .2029563   .1291241     1.57   0.116    -.0504407    .4563533
 _Iyear_2004 |    .091161   .0361036     2.52   0.012     .0203103    .1620118
 _Iyear_2005 |   .1421254   .0398959     3.56   0.000     .0638325    .2204184
 _Iyear_2006 |   .3036052   .0481494     6.31   0.000     .2091154    .3980949
 _Iyear_2007 |   .4730337   .0614907     7.69   0.000     .3523624    .5937049
 _Iyear_2008 |     .45684   .0759762     6.01   0.000     .3077421     .605938
 _Iyear_2009 |   .6316716   .0661327     9.55   0.000     .5018909    .7614523
       _cons |   4.486299   4.106389     1.09   0.275    -3.572203    12.5448
-------------+----------------------------------------------------------------
     sigma_u |  1.406127
     sigma_e |  .24672149
         rho |  .97013269   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Figure 3.2: Stata output of the developing countries regression for the economic variables case

```
. xtreg lnfdi lngdp lngdppc gdpgrowth openness _Iyear_* if dummy==0, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       919
Group variable: economy                         Number of groups   =       138

R-sq:  within  = 0.6952                         Obs per group: min =         2
       between = 0.6085                                        avg =       6.7
       overall = 0.6209                                        max =         7

                                                F(10,771)          =    145.99
corr(u_i, Xb)  = 0.1442                         Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
      lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .7352597   .2754229     2.67   0.008      .194592    1.275927
     lngdppc |  -.3802597   .2734861    -1.39   0.165    -.9171254     .156606
  gdpgrowth |  -.0010604   .0030664    -0.35   0.730    -.0070799    .0049591
   openness |   .1891137   .1461458     1.29   0.196    -.0977771    .4760046
 _Iyear_2004 |   .0991782   .0416197     2.38   0.017     .0174768    .1808796
 _Iyear_2005 |   .1810364   .0466288     3.88   0.000     .0895019    .2725709
 _Iyear_2006 |   .3498887   .0566464     6.18   0.000     .2386893    .4610881
 _Iyear_2007 |    .528278   .0726987     7.27   0.000     .3855671    .6709889
 _Iyear_2008 |   .5628373    .089957     6.26   0.000     .3862475    .7394271
 _Iyear_2009 |   .7335342   .0808097     9.08   0.000     .5749011    .8921674
       _cons |   7.254625   4.549155     1.59   0.111    -1.675575    16.18482
-------------+----------------------------------------------------------------
     sigma_u |  1.2719695
     sigma_e |  .25879393
         rho |  .96024983   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Figure 3.3: Stata output of the advanced economy regression for the economic variables case

```
. xtreg lnfdi lngdp lngdppc gdpgrowth openness _Iyear_* if dummy==1, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       224
Group variable: economy                         Number of groups   =        32

R-sq:  within  = 0.7506                         Obs per group: min =         7
       between = 0.7220                                        avg =       7.0
       overall = 0.7171                                        max =         7

                                                F(10,182)          =     78.65
corr(u_i, Xb)  = -0.7527                        Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
      lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   1.399466   1.071315     1.31   0.193    -.7143285    3.51326
     lngdppc |  -.6493556   1.081244    -0.60   0.549    -2.782741   1.484029
  gdpgrowth |  -.0002796   .0071954    -0.04   0.969    -.0144767   .0139175
   openness |   .2781022   .1527767     1.82   0.070    -.0233391   .5795434
  _Iyear_2004 |   .0794957    .063877     1.24   0.215    -.0465391   .2055304
  _Iyear_2005 |   .0355169   .0661615     0.54   0.592    -.0950252   .1660591
  _Iyear_2006 |   .2032288    .078387     2.59   0.010     .0485647    .357893
  _Iyear_2007 |   .3617253   .0933168     3.88   0.000     .1776033   .5458472
  _Iyear_2008 |   .1849004   .1289083     1.43   0.153    -.0694467   .4392474
  _Iyear_2009 |    .388379   .1044925     3.72   0.000     .1822065   .5945515
        _cons |  -5.214391   17.50632    -0.30   0.766    -39.75583   29.32705
-------------+----------------------------------------------------------------
     sigma_u |  1.1869405
     sigma_e |   .18006755
         rho |   .97750267   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Figure 3.4: Stata output of the simple regression for the global variable case, with the Wald test

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness global _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       709
Group variable: economy                         Number of groups   =       158

R-sq:  within  = 0.6912                         Obs per group: min =         1
       between = 0.6794                                        avg =       4.5
       overall = 0.7024                                        max =         5

                                                F(9,542)           =    117.56
corr(u_i, Xb)  = 0.3431                         Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
      lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .7780838   .3555032     2.19   0.029     .0797508   1.476417
     lngdppc |  -.5000884    .342013    -1.46   0.144    -1.171922    .1717449
  gdpgrowth |    .005523   .0031856     1.73   0.084    -.0007346   .0117805
   openness |   .2418479   .1208315     2.00   0.046     .0044925   .4792033
     global |    .388399   .0745223     5.21   0.000      .242011    .534787
  _Iyear_2004 |  (dropped)
  _Iyear_2005 |  -.4889354   .0623126    -7.85   0.000    -.6113393   -.3665316
  _Iyear_2006 |  -.3349151   .0500571    -6.69   0.000    -.4332448   -.2365853
  _Iyear_2007 |  -.1579125   .0343892    -4.59   0.000     -.225465   -.0903601
  _Iyear_2008 |  -.1621238   .0289798    -5.59   0.000    -.2190502   -.1051974
  _Iyear_2009 |  (dropped)
        _cons |   5.585508   6.220308     0.90   0.370    -6.633357    17.80437
-------------+----------------------------------------------------------------
     sigma_u |  1.3482289
     sigma_e |   .18283033
         rho |   .9819426   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. test global = 0

 ( 1)  global = 0

       F(  1,   542) =   27.16
            Prob > F =    0.0000

.
```

Figure 3.5: Stata output of the developing countries regression for the global variable case, with the Wald test

```
. xtreg lnfdi lngdp lngdppc gdpgrowth openness global _Iyear_* if dummy==0, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       558
Group variable: economy                         Number of groups   =       126

R-sq:  within  = 0.7007                         Obs per group: min =         1
       between = 0.6562                                        avg =       4.4
       overall = 0.6510                                        max =         5

                                                F(9,423)           =     99.23
corr(u_i, Xb)  = 0.5725                         Prob > F           =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
      lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .4118023    .391404     1.05   0.293    -.3575367    1.181141
     lngdppc |  -.3095384   .3681128    -0.84   0.401    -1.033096    .4140197
  gdpgrowth  |   .0053698   .0032593     1.65   0.100    -.0010366    .0117762
    openness |   .3073963   .1442173     2.13   0.034     .0239246     .590868
      global |   .3926709   .0772451     5.08   0.000     .2408387     .544503
 _Iyear_2004 |  (dropped)
 _Iyear_2005 |  (dropped)
 _Iyear_2006 |   .1790623   .0351574     5.09   0.000     .1099573    .2481672
 _Iyear_2007 |   .3773573   .0528842     7.14   0.000     .2734087    .4813059
 _Iyear_2008 |   .4405238   .0779719     5.65   0.000     .2872631    .5937845
 _Iyear_2009 |   .5997944   .0788154     7.61   0.000     .4448758     .754713
       _cons |   11.77178   6.817103     1.73   0.085    -1.627831    25.1714
-------------+----------------------------------------------------------------
     sigma_u |  1.3773321
     sigma_e |  .19100333
         rho |  .98113174   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. test global = 0

 ( 1)  global = 0

       F(  1,   423) =   25.84
            Prob > F =    0.0000
```

Figure 3.6: Stata output of the advanced economies regression for the global variable case, with the Wald test

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness global _Iyear_* if dummy==1, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       151
Group variable: economy                         Number of groups   =        32

R-sq:  within  = 0.7670                         Obs per group: min =         1
       between = 0.7165                                        avg =       4.7
       overall = 0.7157                                        max =         5

                                                F(9,110)           =     36.35
corr(u_i, Xb)  = -0.4268                        Prob > F           =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
      lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   1.058564   1.013258     1.04   0.298    -.9494751    3.066604
     lngdppc |  -.1917431   .9972222    -0.19   0.848    -2.168003    1.784517
  gdpgrowth  |  -.0047604   .0055593    -0.86   0.394    -.0157777    .0062568
    openness |   .2338616   .1748777     1.34   0.184    -.1127048    .5804281
      global |  -.2502515   .1768051    -1.42   0.160    -.6006377    .1001348
 _Iyear_2004 |  (dropped)
 _Iyear_2005 |  -.1734006   .0461479    -3.76   0.000     -.264855   -.0819463
 _Iyear_2006 |  (dropped)
 _Iyear_2007 |   .1436251   .0388983     3.69   0.000     .0665378    .2207125
 _Iyear_2008 |  -.054461    .0764467    -0.71   0.478    -.2059605    .0970385
 _Iyear_2009 |   .1374203   .0665312     2.07   0.041     .0055711    .2692696
       _cons |   1.356587   17.29632     0.08   0.938    -32.92065    35.63383
-------------+----------------------------------------------------------------
     sigma_u |  .83924196
     sigma_e |  .12269557
         rho |   .9790734   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. test global=0

 ( 1)  global = 0

       F(  1,   110) =    2.00
            Prob > F =    0.1598

.
```

Figure 3.7: Stata output of interacting variables regression for the global variable case

```
. xtreg lnfdi lngdp lngdppc gdpgrowth openness global dummy_global _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       709
Group variable: economy                         Number of groups   =       158

R-sq:  within  = 0.6954                         Obs per group: min =         1
       between = 0.0340                                        avg =       4.5
       overall = 0.0361                                        max =         5

                                                F(10,541)          =    109.26
corr(u_i, Xb)  = -0.7474                        Prob > F           =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .6158697    .351177     1.75   0.080    -.0739678    1.305707
     lngdppc |  -.3773825   .3358136    -1.12   0.262    -1.037041    .2822759
   gdpgrowth |   .0054704   .0031535     1.73   0.083    -.0007241    .0116649
    openness |   .2473249   .1200337     2.06   0.040     .0115356    .4831141
      global |   .4086502   .0737577     5.54   0.000     .2637636    .5535368
dummy_global |  -.7101278   .1996431    -3.56   0.000    -1.102299    -.317957
 _Iyear_2004 |  (dropped)
 _Iyear_2005 |  -.5228017   .0634775    -8.24   0.000    -.6474943   -.3981091
 _Iyear_2006 |  -.3551693   .0500784    -7.09   0.000    -.4535412   -.2567974
 _Iyear_2007 |  -.1683752   .0343567    -4.90   0.000     -.235864   -.1008864
 _Iyear_2008 |  -.1636895   .0286698    -5.71   0.000    -.2200072   -.1073718
 _Iyear_2009 |  (dropped)
       _cons |   9.610408   6.216729     1.55   0.123    -2.601477    21.82229
-------------+----------------------------------------------------------------
     sigma_u |  3.3270938
     sigma_e |   .18176907
         rho |   .99702412   (fraction of variance due to u_i)
------------------------------------------------------------------------------

.
```

Figure 3.8: Stata output of Hausman test on interacting regression

```
. xtreg lnfdi lngdp lngdppc gdpgrowth openness global dummy_global _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       709
Group variable: economy                         Number of groups   =       158

R-sq:  within  = 0.6954                         Obs per group: min =         1
       between = 0.0340                                        avg =       4.5
       overall = 0.0361                                        max =         5

                                                F(10,541)          =    109.26
corr(u_i, Xb)  = -0.7474                        Prob > F           =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .6158697    .351177     1.75   0.080    -.0739678    1.305707
     lngdppc |  -.3773825   .3358136    -1.12   0.262    -1.037041    .2822759
   gdpgrowth |   .0054704   .0031535     1.73   0.083    -.0007241    .0116649
    openness |   .2473249   .1200337     2.06   0.040     .0115356    .4831141
      global |   .4086502   .0737577     5.54   0.000     .2637636    .5535368
dummy_global |  -.7101278   .1996431    -3.56   0.000    -1.102299    -.317957
 _Iyear_2004 |  (dropped)
 _Iyear_2005 |  -.5228017   .0634775    -8.24   0.000    -.6474943   -.3981091
 _Iyear_2006 |  -.3551693   .0500784    -7.09   0.000    -.4535412   -.2567974
 _Iyear_2007 |  -.1683752   .0343567    -4.90   0.000     -.235864   -.1008864
 _Iyear_2008 |  -.1636895   .0286698    -5.71   0.000    -.2200072   -.1073718
 _Iyear_2009 |  (dropped)
       _cons |   9.610408   6.216729     1.55   0.123    -2.601477    21.82229
-------------+----------------------------------------------------------------
     sigma_u |  3.3270938
     sigma_e |   .18176907
         rho |   .99702412   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store fix
```

```
. xtreg lnfdi lngdp lngdppc gdpgrowth openness global dummy_global _Iyear_*, re vce (robust)
note: _Iyear_2004 dropped because of collinearity
note: _Iyear_2009 dropped because of collinearity

Random-effects GLS regression                   Number of obs      =       709
Group variable: economy                         Number of groups   =       158

R-sq:  within  = 0.6720                         Obs per group: min =         1
       between = 0.8854                                        avg =       4.5
       overall = 0.8929                                        max =         5

Random effects u_i ~ Gaussian                   Wald chi2(10)      =   2134.36
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |    .792716   .0344174    23.03   0.000     .7252591     .860173
     lngdppc |   -.0113713   .0644986    -0.18   0.860    -.1377862    .1150435
   gdpgrowth |    .0022243   .0030804     0.72   0.470    -.0038131    .0082616
    openness |    .5960566   .0862896     6.91   0.000     .4269321     .765181
      global |    .3223632   .0657911     4.90   0.000      .193415    .4513115
dummy_global |    .0627005   .0254797     2.46   0.014     .0127613    .1126397
 _Iyear_2005 |   -.3395131   .0386032    -8.79   0.000    -.4151739   -.2638522
 _Iyear_2006 |   -.2464161   .0350736    -7.03   0.000    -.3151591   -.1776731
 _Iyear_2007 |   -.1475512   .0313094    -4.71   0.000    -.2089164    -.086186
 _Iyear_2008 |   -.2305532   .0272961    -8.45   0.000    -.2840526   -.1770539
       _cons |    1.183358   .9108792     1.30   0.194    -.6019327    2.968648
-------------+----------------------------------------------------------------
     sigma_u |    .7404151
     sigma_e |    .18176907
         rho |    .94315744   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store rand

.

. hausman fix rand

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fix         rand        Difference          S.E.
-------------+----------------------------------------------------------------
       lngdp |    .6158697     .792716      -.1768463        .3494864
     lngdppc |   -.3773825    -.0113713      -.3660112        .3295614
   gdpgrowth |    .0054704     .0022243       .0032461         .000675
    openness |    .2473249     .5960566      -.3487317        .0834398
      global |    .4086502     .3223632       .086287         .0333425
dummy_global |   -.7101278     .0627005      -.7728283        .1980105
 _Iyear_2005 |   -.5228017    -.3395131      -.1832886        .0503904
 _Iyear_2006 |   -.3551693    -.2464161      -.1087532        .0357448
 _Iyear_2007 |   -.1683752    -.1475512       -.020824        .0141458
 _Iyear_2008 |   -.1636895    -.2305532       .0668637        .0087681
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                 chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =          34.62
               Prob>chi2 =         0.0001
               (V_b-V_B is not positive definite)

.
```

Figure 3.9: Stata output of one year lag regression for global variable case

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness l.global _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       553
Group variable: economy                         Number of groups   =       152

R-sq:  within  = 0.6100                         Obs per group: min =         1
       between = 0.5498                                        avg =       3.6
       overall = 0.5688                                        max =         4

                                                F(8,393)           =     57.63
corr(u_i, Xb)  = -0.3978                        Prob > F           =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |    1.325891   .4455886     2.98   0.003     .4498552    2.201926
     lngdppc |   -.9165236   .4128166    -2.22   0.027    -1.728129   -.1049185
   gdpgrowth |    .0049339   .0037368     1.32   0.187    -.0024126    .0122804
    openness |    .0658837   .1169151     0.56   0.573    -.1639736     .295741
      global |
         L1. |    .2532489    .089917     2.82   0.005     .0764703    .4300275
 _Iyear_2004 |  (dropped)
 _Iyear_2005 |  (dropped)
 _Iyear_2006 |   -.2851796    .058165    -4.90   0.000    -.3995332   -.1708261
 _Iyear_2007 |   -.1318092   .0380957    -3.46   0.001     -.206706   -.0569124
 _Iyear_2008 |   -.1495673   .0253136    -5.91   0.000    -.1993343   -.0998003
 _Iyear_2009 |  (dropped)
       _cons |   -3.227856   7.828921    -0.41   0.680    -18.61966    12.16395
-------------+----------------------------------------------------------------
     sigma_u |   1.6862433
     sigma_e |    .15331652
         rho |    .99180098   (fraction of variance due to u_i)
------------------------------------------------------------------------------

.
```

Figure 3.10: Stata output of the simple regression for all institutional variables case

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness startbusi construct property credit investors taxes trade contracts close _Iyear_*,
> fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       709
Group variable: economy                         Number of groups   =       158

R-sq:  within  = 0.7166                         Obs per group: min =         1
       between = 0.7588                                        avg =       4.5
       overall = 0.7645                                        max =         5

                                                F(17,534)          =     69.31
corr(u_i, Xb)  = 0.6177                         Prob > F           =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
      lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .5550813   .3110245     1.78   0.075    -.0559003    1.166063
     lngdppc |   -.330692   .3038378    -1.09   0.277    -.9275559    .2661719
   gdpgrowth |   .0061715   .0029984     2.06   0.040     .0002814    .0120617
    openness |   .2672793   .1151052     2.32   0.021     .0411647     .493394
   startbusi |   .2761028   .0856616     3.22   0.001     .1078278    .4443779
   construct |   -.129887   .0640018    -2.03   0.043    -.2556132   -.0041608
    property |   .1098438    .033561     3.27   0.001     .0439161    .1757715
      credit |    .023492   .0223296     1.05   0.293    -.0203726    .0673567
   investors |  -.0501206   .0268253    -1.87   0.062    -.1028168    .0025755
       taxes |   .1110093   .0638111     1.74   0.082    -.0143424    .2363609
       trade |   .1161943   .0314096     3.70   0.000     .0544927    .1778959
   contracts |  -.0272653   .0937578    -0.29   0.771    -.2114445     .156914
       close |   .0816191   .0495814     1.65   0.100    -.0157795    .1790176
_Iyear_2004 |  (dropped)
_Iyear_2005 |  -.4823729   .0608735    -7.92   0.000    -.6019539   -.3627919
_Iyear_2006 |  -.3386278   .0499791    -6.78   0.000    -.4368075   -.2404482
_Iyear_2007 |  -.1643285   .0357711    -4.59   0.000    -.2345979   -.0940591
_Iyear_2008 |  -.1627992   .0281604    -5.78   0.000    -.2181181   -.1074804
_Iyear_2009 |  (dropped)
       _cons |   8.102114   5.711635     1.42   0.157    -3.117915    19.32214
-------------+----------------------------------------------------------------
     sigma_u |  1.4082634
     sigma_e |  .17646288
         rho |   .9845413   (fraction of variance due to u_i)
------------------------------------------------------------------------------

.
```

Figure 3.11: Stata output of the developing countries regression for all institutional variables case, with the Wald test

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness startbusi construct property credit investors taxes trade contracts close _Iyear_* i
> f dummy==0, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       558
Group variable: economy                         Number of groups   =       126

R-sq:  within  = 0.7333                         Obs per group: min =         1
       between = 0.5299                                        avg =       4.4
       overall = 0.4613                                        max =         5

                                                F(17,415)          =     63.31
corr(u_i, Xb)  = 0.4747                         Prob > F           =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .1712475   .3665804     0.47   0.641    -.5493384    .8918333
     lngdppc |  -.1049071   .3496675    -0.30   0.764    -.7922475    .5824333
  gdpgrowth  |   .0058722   .0030247     1.94   0.053    -.0000734    .0118177
   openness  |   .3391469   .1354617     2.50   0.013     .0728703    .6054236
   startbusi |   .2592356   .0917739     2.82   0.005      .078836    .4396351
   construct |  -.1294865   .0808978    -1.60   0.110     -.288507     .029534
    property |   .1108648   .0360362     3.08   0.002     .0400286    .1817009
      credit |   .0253346   .0227389     1.11   0.266    -.0193632    .0700324
   investors |  -.0631321   .0276971    -2.28   0.023    -.1175762   -.0086879
       taxes |   .1220127   .0644477     1.89   0.059    -.0046719    .2486973
       trade |   .1423362   .0309002     4.61   0.000     .0815958    .2030766
   contracts |  -.0151534   .1109619    -0.14   0.891    -.2332707     .202964
       close |   .0934939   .0658107     1.42   0.156      -.03587    .2228578
 _Iyear_2004 |  (dropped)
 _Iyear_2005 |  (dropped)
 _Iyear_2006 |   .1607499   .0335573     4.79   0.000     .0947863    .2267134
 _Iyear_2007 |   .3493966    .049426     7.07   0.000     .2522401    .4465532
 _Iyear_2008 |   .4192108   .0737096     5.69   0.000       .27432    .5641015
 _Iyear_2009 |   .5811361   .0756282     7.68   0.000      .432474    .7297983
       _cons |    14.2233   6.428238     2.21   0.027     1.587332    26.85926
-------------+----------------------------------------------------------------
     sigma_u |  1.5823259
     sigma_e |  .18204249
         rho |    .986937   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. test startbusi=0

 ( 1)  startbusi = 0

       F(  1,   415) =    7.98
            Prob > F =    0.0050

. test  construct =0

 ( 1)  construct = 0

       F(  1,   415) =    2.56
            Prob > F =    0.1102

. test property =0

 ( 1)  property = 0

       F(  1,   415) =    9.46
            Prob > F =    0.0022

. test  credit =0

 ( 1)  credit = 0

       F(  1,   415) =    1.24
            Prob > F =    0.2659

. test investors =0

 ( 1)  investors = 0

       F(  1,   415) =    5.20
            Prob > F =    0.0232

. test  taxes =0

 ( 1)  taxes = 0

       F(  1,   415) =    3.58
            Prob > F =    0.0590

. test trade =0

 ( 1)  trade = 0

       F(  1,   415) =   21.22
            Prob > F =    0.0000

. test contracts =0

 ( 1)  contracts = 0

       F(  1,   415) =    0.02
            Prob > F =    0.8914

. test close =0

 ( 1)  close = 0

       F(  1,   415) =    2.02
            Prob > F =    0.1562

.
```

Figure 3.12: Stata output of the advanced economies regression for all institutional variables case, with the Wald test

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness startbusi construct property credit investors taxes trade contracts close _Iyear_* i
> f dummy==1, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       151
Group variable: economy                         Number of groups   =        32

R-sq:  within  = 0.7907                         Obs per group: min =         1
       between = 0.7463                                        avg =       4.7
       overall = 0.7523                                        max =         5

                                                F(17,102)          =     28.25
corr(u_i, Xb)  = -0.5243                        Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   1.123714   1.04944     1.07   0.287    -.957846    3.205273
     lngdppc |  -.2835263   1.074874    -0.26   0.792   -2.415534    1.848481
   gdpgrowth |  -.0018367   .0060846    -0.30   0.763   -.0139055     .010232
    openness |   .3052175   .1687162     1.81   0.073   -.0294303    .6398653
   startbusi |   .2547362   .1003293     2.54   0.013    .0557335     .453739
   construct |  -.0107236   .0849387    -0.13   0.900   -.1791991    .1577519
    property |  -.0197201   .0676922    -0.29   0.771   -.1539873    .1145472
      credit |  -.0356718   .0694387    -0.51   0.609   -.1734031    .1020595
   investors |   .1339861   .0893273     1.50   0.137   -.0431943    .3111664
       taxes |  -.1411365   .1851237    -0.76   0.448   -.5083285    .2260555
       trade |  -.1040724   .0661141    -1.57   0.119   -.2352094    .0270646
   contracts |  -.0550836   .1259753    -0.44   0.663    -.304955    .1947877
       close |   -.022394   .0382162    -0.59   0.559   -.0981956    .0534076
 _Iyear_2004 |  (dropped)
 _Iyear_2005 |  -.1625272    .046735    -3.48   0.001   -.2552258   -.0698286
 _Iyear_2006 |  (dropped)
 _Iyear_2007 |   .1409023   .0397187     3.55   0.001    .0621205    .2196841
 _Iyear_2008 |   -.066476   .0774248    -0.86   0.393   -.2200478    .0870958
 _Iyear_2009 |   .1423572   .0750029     1.90   0.061   -.0064107     .291125
       _cons |  -1.505451   18.44472    -0.08   0.935   -38.09046    35.07956
-------------+----------------------------------------------------------------
     sigma_u |  .85448572
     sigma_e |  .12075901
         rho |  .98041872   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. test startbusi=0

 ( 1)  startbusi = 0

       F(  1,   102) =    6.45
            Prob > F =    0.0126

. test  construct =0

 ( 1)  construct = 0

       F(  1,   102) =    0.02
            Prob > F =    0.8998

. test property =0

 ( 1)  property = 0

       F(  1,   102) =    0.08
            Prob > F =    0.7714

. test  credit =0

 ( 1)  credit = 0

       F(  1,   102) =    0.26
            Prob > F =    0.6086

. test investors =0

 ( 1)  investors = 0

       F(  1,   102) =    2.25
            Prob > F =    0.1367

. test  taxes =0

 ( 1)  taxes = 0

       F(  1,   102) =    0.58
            Prob > F =    0.4476

. test trade =0

 ( 1)  trade = 0

       F(  1,   102) =    2.48
            Prob > F =    0.1186

. test contracts =0

 ( 1)  contracts = 0

       F(  1,   102) =    0.19
            Prob > F =    0.6628

. test close =0

 ( 1)  close = 0

       F(  1,   102) =    0.34
            Prob > F =    0.5592

.
```

Figure 3.13: Stata output of Hausman test on developing countries regression for all institutional variables

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness startbusi construct property credit investors taxes trade contracts close _Iyear_* i
> f dummy==0, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       558
Group variable: economy                         Number of groups   =       126

R-sq:  within  = 0.7333                         Obs per group: min =         1
       between = 0.5299                                        avg =       4.4
       overall = 0.4613                                        max =         5

                                                F(17,415)          =     63.31
corr(u_i, Xb)  = 0.4747                         Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .1712475   .3665804     0.47   0.641    -.5493384    .8918333
     lngdppc |  -.1049071   .3496675    -0.30   0.764    -.7922475    .5824333
   gdpgrowth |   .0058722   .0030247     1.94   0.053    -.0000734    .0118177
    openness |   .3391469   .1354617     2.50   0.013     .0728703    .6054236
   startbusi |   .2592356   .0917739     2.82   0.005      .078836    .4396351
   construct |  -.1294865   .0808978    -1.60   0.110     -.288507     .029534
    property |   .1108648   .0360362     3.08   0.002     .0400286    .1817009
      credit |   .0253346   .0227389     1.11   0.266    -.0193632    .0700324
   investors |  -.0631321   .0276971    -2.28   0.023    -.1175762   -.0086879
       taxes |   .1220127   .0644477     1.89   0.059    -.0046719    .2486973
       trade |   .1423362   .0309002     4.61   0.000     .0815958    .2030766
   contracts |  -.0151534   .1109619    -0.14   0.891    -.2332707     .202964
       close |   .0934939   .0658107     1.42   0.156      -.03587    .2228578
 _Iyear_2004 |  (dropped)
 _Iyear_2005 |  (dropped)
 _Iyear_2006 |   .1607499   .0335573     4.79   0.000     .0947863    .2267134
 _Iyear_2007 |   .3493966    .049426     7.07   0.000     .2522401    .4465532
 _Iyear_2008 |   .4192108   .0737096     5.69   0.000       .27432    .5641015
 _Iyear_2009 |   .5811361   .0756282     7.68   0.000      .432474    .7297983
       _cons |    14.2233   6.428238     2.21   0.027     1.587332    26.85926
-------------+----------------------------------------------------------------
     sigma_u |  1.5823259
     sigma_e |  .18204249
         rho |    .986937   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store effectsfixed


. xtreg  lnfdi lngdp lngdppc gdpgrowth openness startbusi construct property credit investors taxes trade contracts close _Iyear_* i
> f dummy==0, re vce (robust)
note: _Iyear_2004 dropped because of collinearity
note: _Iyear_2009 dropped because of collinearity

Random-effects GLS regression                   Number of obs      =       558
Group variable: economy                         Number of groups   =       126

R-sq:  within  = 0.7056                         Obs per group: min =         1
       between = 0.8161                                        avg =       4.4
       overall = 0.8240                                        max =         5

Random effects u_i ~ Gaussian                   Wald chi2(17)      =   1571.48
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .7823213   .0384948    20.32   0.000     .7068729    .8577697
     lngdppc |   -.091953   .0666879    -1.38   0.168    -.2226589    .0387529
   gdpgrowth |   .0020075   .0032221     0.62   0.533    -.0043077    .0083226
    openness |    .678984   .1140001     5.96   0.000     .4555479    .9024202
   startbusi |   .1731777   .0884566     1.96   0.050     -.000194    .3465493
   construct |  -.0949697    .06821    -1.39   0.164    -.2286588    .0387195
    property |   .0722608    .03791     1.91   0.057    -.0020414     .146563
      credit |   .0300054   .0207447     1.45   0.148    -.0106534    .0706641
   investors |  -.0543056   .0238028    -2.28   0.023    -.1009583   -.0076529
       taxes |   .0488482   .0593248     0.82   0.410    -.0674263    .1651227
       trade |   .1611021   .0280932     5.73   0.000     .1060403    .2161639
   contracts |   .0555873   .0631709     0.88   0.379    -.0682254       .1794
       close |   .0836251   .0586258     1.43   0.154    -.0312793    .1985296
 _Iyear_2005 |  -.3374147   .0465427    -7.25   0.000    -.4286367   -.2461928
 _Iyear_2006 |  -.2684212   .0432189    -6.21   0.000    -.3531287   -.1837137
 _Iyear_2007 |  -.1886652   .0376012    -5.02   0.000    -.2623622   -.1149681
 _Iyear_2008 |  -.2233572   .0313321    -7.13   0.000    -.2847669   -.1619475
       _cons |   .6257757   1.478486     0.42   0.672    -2.272003    3.523554
-------------+----------------------------------------------------------------
     sigma_u |  .76063455
     sigma_e |  .18204249
         rho |  .94582437   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store effectsrandom

.
```

```
. hausman effectsfixed effectsrandom

                 ---- Coefficients ----
              |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
              | effectsfixed effectsran~m    Difference          S.E.
--------------+----------------------------------------------------------------
        lngdp |    .1712475     .7823213      -.6110738        .3645536
      lngdppc |   -.1049071     -.091953      -.0129541        .3432493
   gdpgrowth |    .0058722     .0020075       .0038647              .
    openness |    .3391469      .678984      -.3398371         .07317
   startbusi |    .2592356     .1731777       .0860579        .0244516
   construct |   -.1294865    -.0949697      -.0345168        .0434954
    property |    .1108648     .0722608        .038604              .
      credit |    .0253346     .0300054      -.0046707        .0093122
   investors |   -.0631321    -.0543056      -.0088265        .0141618
       taxes |    .1220127     .0488482       .0731645        .0251807
       trade |    .1423362     .1611021      -.0187659        .0128682
   contracts |   -.0151534     .0555873      -.0707407        .0912249
       close |    .0934939     .0836251       .0098688         .029901
_Iyear_2006 |    .1607499    -.2684212        .429171              .
_Iyear_2007 |    .3493966    -.1886652       .5380618        .0320792
_Iyear_2008 |    .4192108    -.2233572        .642568        .0667189
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                chi2(16) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                         =          86.75
              Prob>chi2 =         0.0000
              (V_b-V_B is not positive definite)

.
```

Figure 3.14: Stata output of Hausman test on advanced economies regression for all institutional variables

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness startbusi construct property credit investors taxes trade contracts close _Iyear_* i
> f dummy==1, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       151
Group variable: economy                         Number of groups   =        32

R-sq:  within  = 0.7907                         Obs per group: min =         1
       between = 0.7463                                        avg =       4.7
       overall = 0.7523                                        max =         5

                                                F(17,102)          =     28.25
corr(u_i, Xb)  = -0.5243                        Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   1.123714    1.04944     1.07   0.287    -.957846    3.205273
     lngdppc |  -.2835263   1.074874    -0.26   0.792   -2.415534    1.848481
  gdpgrowth |  -.0018367   .0060846    -0.30   0.763   -.0139055     .010232
    openness |   .3052175   .1687162     1.81   0.073   -.0294303    .6398653
   startbusi |   .2547362   .1003293     2.54   0.013    .0557335     .453739
   construct |  -.0107236   .0849387    -0.13   0.900   -.1791991    .1577519
    property |  -.0197201   .0676922    -0.29   0.771   -.1539873    .1145472
      credit |  -.0356718   .0694387    -0.51   0.609   -.1734031    .1020595
   investors |   .1339861   .0893273     1.50   0.137   -.0431943    .3111664
       taxes |  -.1411365   .1851237    -0.76   0.448   -.5083285    .2260555
       trade |  -.1040724   .0661141    -1.57   0.119   -.2352094    .0270646
   contracts |  -.0550836   .1259753    -0.44   0.663    -.304955    .1947877
       close |   -.022394   .0382162    -0.59   0.559   -.0981956    .0534076
_Iyear_2004 |  (dropped)
_Iyear_2005 |  -.1625272    .046735    -3.48   0.001   -.2552258   -.0698286
_Iyear_2006 |  (dropped)
_Iyear_2007 |   .1409023   .0397187     3.55   0.001    .0621205    .2196841
_Iyear_2008 |   -.066476   .0774248    -0.86   0.393   -.2200478    .0870958
_Iyear_2009 |   .1423572   .0750029     1.90   0.061   -.0064107     .291125
       _cons |  -1.505451   18.44472    -0.08   0.935   -38.09046    35.07956
-------------+----------------------------------------------------------------
     sigma_u |  .85448572
     sigma_e |  .12075901
         rho |  .98041872   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store effectsfixe

.
```

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness startbusi construct property credit investors taxes trade contracts close _Iyear_* i
> f dummy==1, re vce (robust)
note: _Iyear_2004 dropped because of collinearity
note: _Iyear_2009 dropped because of collinearity

Random-effects GLS regression                   Number of obs      =       151
Group variable: economy                         Number of groups   =        32

R-sq:  within  = 0.7777                         Obs per group: min =         1
       between = 0.8660                                        avg =       4.7
       overall = 0.8731                                        max =         5

Random effects u_i ~ Gaussian                   Wald chi2(17)      =    671.24
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .8547367   .0890429     9.60   0.000     .6802157    1.029258
     lngdppc |   .1522896   .2546278     0.60   0.550    -.3467717     .651351
  gdpgrowth |  -.0052982   .0052944    -1.00   0.317    -.0156749    .0050786
   openness |   .5074892   .0980809     5.17   0.000     .3152541    .6997242
  startbusi |   .3855402   .1724923     2.24   0.025     .0474614    .7236189
  construct |  -.0445174   .0951232    -0.47   0.640    -.2309554    .1419206
   property |  -.0168886   .0625602    -0.27   0.787    -.1395045    .1057272
     credit |   -.036307   .0672561    -0.54   0.589    -.1681266    .0955126
  investors |   .0454504   .0429091     1.06   0.289    -.0386498    .1295507
      taxes |   .0173545   .1919715     0.09   0.928    -.3589026    .3936117
      trade |  -.0920492   .0500796    -1.84   0.066    -.1902034     .006105
  contracts |   .0802152    .068685     1.17   0.243    -.0544049    .2148354
      close |  -.0464593   .0432074    -1.08   0.282    -.1311443    .0382257
_Iyear_2005 |   -.242632   .0608055    -3.99   0.000    -.3618087   -.1234554
_Iyear_2006 |  -.1045899   .0565245    -1.85   0.064    -.2153759    .0061962
_Iyear_2007 |   .0099575   .0617829     0.16   0.872    -.1111348    .1310498
_Iyear_2008 |  -.2359413   .0497643    -4.74   0.000    -.3334775   -.1384051
      _cons |  -1.795243   2.312808    -0.78   0.438    -6.328263    2.737777
-------------+----------------------------------------------------------------
     sigma_u |  .39150285
     sigma_e |  .12075901
         rho |  .91312414   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store effectsrando

.

. hausman effectsfixe effectsrando

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             | effectsfixe  effectsrando     Difference          S.E.
-------------+----------------------------------------------------------------
       lngdp |    1.123714     .8547367       .2689769        1.045656
     lngdppc |   -.2835263     .1522896       -.435816        1.044279
  gdpgrowth |   -.0018367    -.0052982       .0034614        .0029986
   openness |    .3052175     .5074892      -.2022717        .1372782
  startbusi |    .2547362     .3855402      -.1308039               .
  construct |   -.0107236    -.0445174       .0337938               .
   property |   -.0197201    -.0168886      -.0028314        .0258545
     credit |   -.0356718     -.036307       .0006352        .0172726
  investors |    .1339861     .0454504       .0885356        .0783466
      taxes |   -.1411365     .0173545       -.158491               .
      trade |   -.1040724    -.0920492      -.0120232        .0431637
  contracts |   -.0550836     .0802152      -.1352989        .1056037
      close |    -.022394    -.0464593       .0240653               .
_Iyear_2005 |   -.1625272     -.242632       .0801048               .
_Iyear_2007 |    .1409023     .0099575       .1309448               .
_Iyear_2008 |    -.066476    -.2359413       .1694653        .0593138
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                 chi2(16) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =          5.14
               Prob>chi2 =        0.9950
               (V_b-V_B is not positive definite)

.
```

Figure 3.15: Stata output of interacting variables regression for all institutional variables

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness  startbusi construct property credit investors taxes trade contracts close dummy_sta
> rtbusi dummy_construct dummy_property dummy_credit dummy_investors dummy_taxes dummy_trade dummy_contracts dummy_close _Iyear_*, f
> e vce (robust)

Fixed-effects (within) regression               Number of obs      =       709
Group variable: economy                         Number of groups   =       158

R-sq:  within  = 0.7265                         Obs per group: min =         1
       between = 0.0454                                        avg =       4.5
       overall = 0.0456                                        max =         5

                                                F(26,525)          =     54.40
corr(u_i, Xb)  = -0.6694                        Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .3640787   .3239962     1.12   0.262    -.2724095    1.000567
     lngdppc |  -.1802197   .3146313    -0.57   0.567    -.7983108    .4378713
   gdpgrowth |   .0064554   .0029775     2.17   0.031     .0006062    .0123047
    openness |   .2810606   .1143898     2.46   0.014     .0563427    .5057785
   startbusi |   .2690938   .0919434     2.93   0.004     .0884718    .4497159
   construct |  -.1266374   .0804442    -1.57   0.116    -.2846694    .0313946
    property |   .1095541   .0358132     3.06   0.002     .0391994    .1799088
      credit |   .0302039   .0229561     1.32   0.189    -.0148931    .0753009
   investors |  -.0606938   .0280648    -2.16   0.031     -.115827   -.0055606
       taxes |   .1256355   .0643061     1.95   0.051    -.0006934    .2519644
       trade |   .1356593   .0311806     4.35   0.000     .0744052    .1969133
   contracts |  -.0283961   .1124608    -0.25   0.801    -.2493245    .1925324
       close |   .0862023   .0671561     1.28   0.200    -.0457254      .21813
dummy_star~i |   .0314541   .1289939     0.24   0.807    -.2219535    .2848617
dummy_cons~t |   .0160487   .1226918     0.13   0.896    -.2249785    .2570759
dummy_prop~y |  -.0928964   .1009352    -0.92   0.358    -.2911829    .1053902
dummy_credit |  -.1439893   .0938856    -1.53   0.126    -.3284268    .0404483
dummy_inve~s |   .1798675   .0859396     2.09   0.037     .0110398    .3486951
 dummy_taxes |   -.278684   .1942924    -1.43   0.152      -.66037     .103002
 dummy_trade |  -.1859656   .0914251    -2.03   0.042    -.3655696   -.0063616
dummy_cont~s |  -.0306588   .1614742    -0.19   0.849    -.3478736    .2865561
 dummy_close |  -.0108278   .0914194    -0.12   0.906    -.1904204    .1687649
  _Iyear_2004 |  (dropped)
  _Iyear_2005 |  -.5182582   .0627908    -8.25   0.000    -.6416103    -.394906
  _Iyear_2006 |  -.3616364   .0503712    -7.18   0.000    -.4605904   -.2626825
  _Iyear_2007 |  -.1798357   .0361305    -4.98   0.000    -.2508138   -.1088577
  _Iyear_2008 |  -.1677984   .0280505    -5.98   0.000    -.2229033   -.1126934
  _Iyear_2009 |  (dropped)
        _cons |   12.25071   5.864467     2.09   0.037      .730002    23.77141
-------------+----------------------------------------------------------------
      sigma_u |  2.9661905
      sigma_e |   .1748212
          rho |  .99653834   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Figure 3.16: Stata output of one year lag regression for all institutional variables

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness l.startbusi l.construct l.property l.credit l.investors l.taxes l.trade l.contracts
> l.close _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       553
Group variable: economy                         Number of groups   =       152

R-sq:  within  = 0.6288                         Obs per group: min =         1
       between = 0.6121                                        avg =       3.6
       overall = 0.6349                                        max =         4

                                                F(16,385)          =     32.03
corr(u_i, Xb)  = -0.1893                        Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
      lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |    1.13986   .3828038     2.98   0.003     .3872121    1.892507
     lngdppc |   -.7736919   .3547319    -2.18   0.030    -1.471146   -.0762377
   gdpgrowth |    .0050171   .0037267     1.35   0.179    -.0023101    .0123444
    openness |    .0660375   .1194505     0.55   0.581    -.1688194    .3008945
   startbusi |
         L1. |    .1913039   .0778358     2.46   0.014     .0382676    .3443403
   construct |
         L1. |   -.0981765   .0904522    -1.09   0.278    -.2760185    .0796656
    property |
         L1. |    .0094652   .0370534     0.26   0.799    -.0633872    .0823176
      credit |
         L1. |    .0109223   .0246359     0.44   0.658    -.0375156    .0593601
   investors |
         L1. |   -.0258826   .0352021    -0.74   0.463    -.0950951    .0433299
       taxes |
         L1. |    .0783997   .0501064     1.56   0.118    -.0201167    .1769161
       trade |
         L1. |    .0811319   .0314501     2.58   0.010     .0192965    .1429673
   contracts |
         L1. |    .1266061    .117992     1.07   0.284    -.1053832    .3585955
       close |
         L1. |    .0674712   .0410488     1.64   0.101    -.0132368    .1481791
 _Iyear_2004 |  (dropped)
 _Iyear_2005 |  (dropped)
 _Iyear_2006 |   -.2837419   .0576904    -4.92   0.000    -.3971696   -.1703143
 _Iyear_2007 |   -.1313511   .0385943    -3.40   0.001     -.207233   -.0554692
 _Iyear_2008 |   -.1495164   .0254955    -5.86   0.000    -.1996442   -.0993886
 _Iyear_2009 |  (dropped)
       _cons |   -1.498303   6.952057    -0.22   0.829    -15.16706    12.17045
-------------+----------------------------------------------------------------
     sigma_u |  1.4508457
     sigma_e |   .15112625
         rho |   .98926627   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Figure 3.17: Stata output of the simple regression for starting a business variable and the respective Wald test

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness startbusi _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =      1083
Group variable: economy                         Number of groups   =       170

R-sq:  within  = 0.7120                         Obs per group: min =         2
       between = 0.8035                                        avg =       6.4
       overall = 0.8069                                        max =         7

                                                F(11,902)          =    170.32
corr(u_i, Xb)  = 0.6494                         Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
      lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |    .624562   .4001423     1.56   0.119    -.1607563     1.40988
     lngdppc |   -.2165264   .3930818    -0.55   0.582    -.9879878     .554935
   gdpgrowth |    .0010984   .0031142     0.35   0.724    -.0050135    .0072102
    openness |    .3779538   .1259251     3.00   0.003     .1308135    .6250942
   startbusi |    .2701444   .0532928     5.07   0.000     .1655521    .3747367
 _Iyear_2004 |    .0735038   .0379105     1.94   0.053    -.0008994    .1479069
 _Iyear_2005 |    .1171631   .0433597     2.70   0.007     .0320656    .2022607
 _Iyear_2006 |    .2740657   .0531269     5.16   0.000      .169799    .3783325
 _Iyear_2007 |    .4389476   .0695309     6.31   0.000     .3024864    .5754087
 _Iyear_2008 |    .4134396   .0863463     4.79   0.000     .2439767    .5829026
 _Iyear_2009 |    .5958951    .081693     7.29   0.000     .4355646    .7562256
       _cons |    6.446555   6.641089     0.97   0.332    -6.58723    19.48034
-------------+----------------------------------------------------------------
     sigma_u |  1.3733118
     sigma_e |   .23524182
         rho |   .97149435   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. test startbusi=0

 ( 1)  startbusi = 0

       F(  1,   902) =   25.70
            Prob > F =    0.0000
```

Figure 3.18: Stata output of the simple regression for dealing with construction permits variable and the respective Wald test

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness construct _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       793
Group variable: economy                         Number of groups   =       168

R-sq:  within  = 0.6718                         Obs per group: min =         1
       between = 0.6682                                        avg =       4.7
       overall = 0.6854                                        max =         5

                                                F(9,616)           =    120.39
corr(u_i, Xb)  = 0.1669                         Prob > F           =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .8904618   .3218648     2.77   0.006     .2583764    1.522547
     lngdppc |   -.439972   .3049331    -1.44   0.150    -1.038807    .1588625
   gdpgrowth |   .0043072    .003044     1.41   0.158    -.0016707    .0102851
    openness |    .237125   .1310687     1.81   0.071    -.0202706    .4945206
   construct |    .034947   .0718346     0.49   0.627    -.1061234    .1760175
 _Iyear_2004 |  (dropped)
 _Iyear_2005 |  -.5205224   .0572885    -9.09   0.000    -.6330267    -.408018
 _Iyear_2006 |  -.3600588   .0473031    -7.61   0.000    -.4529537   -.2671638
 _Iyear_2007 |   -.189596   .0320912    -5.91   0.000    -.2526174   -.1265746
 _Iyear_2008 |  -.1976178    .030107    -6.56   0.000    -.2567427    -.138493
 _Iyear_2009 |  (dropped)
       _cons |   4.799972   5.610881     0.86   0.393    -6.218802    15.81875
-------------+----------------------------------------------------------------
     sigma_u |  1.3857961
     sigma_e |  .19414021
         rho |  .98075174   (fraction of variance due to u_i)
------------------------------------------------------------------------------

.
. test construct=0

 ( 1)  construct = 0

       F(  1,   616) =    0.24
            Prob > F =    0.6268
```

Figure 3.19: Stata output of the simple regression for registering property variable and the respective Wald test

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness property _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       934
Group variable: economy                         Number of groups   =       169

R-sq:  within  = 0.6855                         Obs per group: min =         1
       between = 0.7388                                        avg =       5.5
       overall = 0.7488                                        max =         6

                                                F(10,755)          =    148.88
corr(u_i, Xb)  = 0.4661                         Prob > F           =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .7190143   .3380945     2.13   0.034     .0552974    1.382731
     lngdppc |   -.299754   .3353317    -0.89   0.372    -.9580473    .3585393
   gdpgrowth |   .0046707   .0033044     1.41   0.158    -.0018162    .0111577
    openness |   .2957626   .1347922     2.19   0.029     .0311506    .5603746
    property |    .120907   .0326033     3.71   0.000     .0569031    .1849109
 _Iyear_2004 |  (dropped)
 _Iyear_2005 |   .0516498   .0340777     1.52   0.130    -.0152485    .1185481
 _Iyear_2006 |   .2103458   .0383243     5.49   0.000     .1351109    .2855807
 _Iyear_2007 |   .3809072   .0537438     7.09   0.000     .2754021    .4864123
 _Iyear_2008 |   .3708313   .0719709     5.15   0.000     .2295444    .5121182
 _Iyear_2009 |   .5683346   .0659669     8.62   0.000     .4388342     .697835
       _cons |   6.469159   5.651275     1.14   0.253    -4.624922    17.56324
-------------+----------------------------------------------------------------
     sigma_u |  1.3555051
     sigma_e |  .21922097
         rho |  .97451124   (fraction of variance due to u_i)
------------------------------------------------------------------------------

.
. test property=0

 ( 1)  property = 0

       F(  1,   755) =   13.75
            Prob > F =    0.0002
```

Figure 3.20: Stata output of the simple regression for getting credit variable and the respective Wald test

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness credit _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       875
Group variable: economy                         Number of groups   =       170

R-sq:  within  = 0.6706                         Obs per group: min =         1
       between = 0.7292                                        avg =       5.1
       overall = 0.7487                                        max =         6

                                                F(10,695)          =    123.34
corr(u_i, Xb)  = 0.4711                         Prob > F           =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .7264836   .3542444     2.05   0.041      .030966    1.422001
     lngdppc |  -.3413198   .3517345    -0.97   0.332    -1.031909    .3492698
   gdpgrowth |   .0049278   .0032225     1.53   0.127    -.0013992    .0112548
    openness |   .3337712   .1570001     2.13   0.034     .0255199    .6420225
      credit |    .057673   .0235414     2.45   0.015     .0114522    .1038938
  _Iyear_2004 |  (dropped)
  _Iyear_2005 |   .0348576   .0366712     0.95   0.342    -.037142    .1068572
  _Iyear_2006 |   .1893681    .040129     4.72   0.000     .1105796    .2681566
  _Iyear_2007 |   .3638121   .0563015     6.46   0.000     .2532707    .4743536
  _Iyear_2008 |   .3579555   .0751939     4.76   0.000      .210321    .5055901
  _Iyear_2009 |     .55186   .0666743     8.28   0.000     .4209527    .6827673
        _cons |   7.38439   5.931151     1.25   0.214    -4.260731    19.02951
-------------+----------------------------------------------------------------
      sigma_u |  1.364768
      sigma_e |  .21761786
          rho |  .97520482   (fraction of variance due to u_i)
------------------------------------------------------------------------------

.

. test credit=0

 ( 1)  credit = 0

       F(  1,   695) =    6.00
            Prob > F =    0.0145

.
```

Figure 3.21: Stata output of the simple regression for strength of investor protection variable and the respective Wald test

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness investors _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       798
Group variable: economy                         Number of groups   =       169

R-sq:  within  = 0.6677                         Obs per group: min =         1
       between = 0.7006                                        avg =       4.7
       overall = 0.7155                                        max =         5

                                                F(9,620)           =    118.60
corr(u_i, Xb)  = 0.2875                         Prob > F           =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .8239718    .326072     2.53   0.012      .1836324    1.464311
     lngdppc |  -.3736878   .3075828    -1.21   0.225    -.9777182    .2303426
   gdpgrowth |   .0038242   .0030455     1.26   0.210    -.0021564    .0098049
    openness |    .261186    .132555     1.97   0.049     .0008747    .5214972
   investors |   .0137033   .0272958     0.50   0.616    -.0399002    .0673067
  _Iyear_2004 |  (dropped)
  _Iyear_2005 |  -.5177031   .0587308    -8.81   0.000    -.6330386   -.4023676
  _Iyear_2006 |  -.3573885   .0488064    -7.32   0.000    -.4532343   -.2615426
  _Iyear_2007 |  -.1878467   .0338821    -5.54   0.000    -.2543843   -.1213091
  _Iyear_2008 |  -.1962637   .0301331    -6.51   0.000    -.2554391   -.1370883
  _Iyear_2009 |  (dropped)
        _cons |   6.061269   5.656319     1.07   0.284    -5.046598    17.16913
-------------+----------------------------------------------------------------
      sigma_u |  1.3561591
      sigma_e |  .19471994
          rho |  .97980065   (fraction of variance due to u_i)
------------------------------------------------------------------------------

.

. test investors=0

 ( 1)  investors = 0

       F(  1,   620) =    0.25
            Prob > F =    0.6158
```

Figure 3.22: Stata output of the simple regression for paying taxes variable and the respective Wald test

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness taxes _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       798
Group variable: economy                         Number of groups   =       169

R-sq:  within  = 0.6726                         Obs per group: min =         1
       between = 0.6648                                        avg =       4.7
       overall = 0.6821                                        max =         5

                                                F(9,620)           =    120.17
corr(u_i, Xb)  = 0.1640                         Prob > F           =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .8967038   .3238101     2.77   0.006     .2608062    1.532601
     lngdppc |  -.4828161   .3096838    -1.56   0.119    -1.090972    .1253402
   gdpgrowth |    .004766   .0030482     1.56   0.118      -.00122     .010752
    openness |   .2605497   .1308042     1.99   0.047     .0036767    .5174228
       taxes |   .1421506   .0640191     2.22   0.027     .0164301    .2678711
  _Iyear_2004 |  (dropped)
  _Iyear_2005 |  -.5113846   .0589016    -8.68   0.000    -.6270553   -.3957139
  _Iyear_2006 |  -.3513831    .048688    -7.22   0.000    -.4469964   -.2557698
  _Iyear_2007 |  -.1808803   .0335078    -5.40   0.000    -.2466828   -.1150778
  _Iyear_2008 |  -.1921391   .0301219    -6.38   0.000    -.2512923   -.1329859
  _Iyear_2009 |  (dropped)
        _cons |   4.086834   5.737645     0.71   0.477    -7.180741    15.35441
-------------+----------------------------------------------------------------
      sigma_u |  1.3950764
      sigma_e |   .1932915
          rho |   .98116475   (fraction of variance due to u_i)
------------------------------------------------------------------------------

.
. test taxes=0

 ( 1)  taxes = 0

       F(  1,   620) =    4.93
            Prob > F =    0.0267
```

Figure 3.23: Stata output of the simple regression for trading across borders variable and the respective Wald test

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness trade _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       798
Group variable: economy                         Number of groups   =       169

R-sq:  within  = 0.6814                         Obs per group: min =         1
       between = 0.7693                                        avg =       4.7
       overall = 0.7773                                        max =         5

                                                F(9,620)           =    120.15
corr(u_i, Xb)  = 0.4518                         Prob > F           =    0.0000

                                    (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |    .740255   .3183612     2.33   0.020      .115058    1.365452
     lngdppc |  -.3150759   .3055962    -1.03   0.303    -.9152051    .2850533
   gdpgrowth |   .0035622   .0029128     1.22   0.222    -.0021579    .0092822
    openness |   .2332668   .1264426     1.84   0.066    -.0150408    .4815745
       trade |   .1355078   .0316728     4.28   0.000     .0733088    .1977068
  _Iyear_2004 |  (dropped)
  _Iyear_2005 |  -.5032685   .0552875    -9.10   0.000    -.6118421    -.394695
  _Iyear_2006 |  -.3517039   .0457509    -7.69   0.000    -.4415494   -.2618584
  _Iyear_2007 |  -.1907112   .0318683    -5.98   0.000    -.2532942   -.1281282
  _Iyear_2008 |  -.1876642   .0291814    -6.43   0.000    -.2449705    -.130358
  _Iyear_2009 |  (dropped)
        _cons |   6.675326   5.469393     1.22   0.223    -4.065455    17.41611
-------------+----------------------------------------------------------------
      sigma_u |  1.2795458
      sigma_e |   .19067842
          rho |   .97827536   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. test trade=0

 ( 1)  trade = 0

       F(  1,   620) =   18.30
            Prob > F =    0.0000
```

Figure 3.24: Stata output of the simple regression for enforcing contracts variable and the respective Wald test

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness contracts _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =      1078
Group variable: economy                         Number of groups   =       170

R-sq:  within  = 0.7116                         Obs per group: min =         2
       between = 0.8174                                        avg =       6.3
       overall = 0.8250                                        max =         7

                                                F(11,897)          =    167.90
corr(u_i, Xb)  = 0.6118                         Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .6109753    .433512     1.41   0.159    -.2398407    1.461791
     lngdppc |  -.1817235   .4289899    -0.42   0.672    -1.023664    .6602174
  gdpgrowth |   .0001939   .0031051     0.06   0.950    -.0059003     .006288
   openness |   .3244177   .1136437     2.85   0.004     .1013791    .5474563
  contracts |   .3415657   .1038917     3.29   0.001     .1376667    .5454648
 _Iyear_2004 |   .0783081   .0368034     2.13   0.034     .0060774    .1505389
 _Iyear_2005 |   .1273024   .0416451     3.06   0.002     .0455693    .2090355
 _Iyear_2006 |   .2835859   .0502144     5.65   0.000     .1850344    .3821373
 _Iyear_2007 |   .4561424    .065098     7.01   0.000     .3283804    .5839045
 _Iyear_2008 |   .4446345   .0812094     5.48   0.000      .285252     .604017
 _Iyear_2009 |   .6321682   .0761694     8.30   0.000     .4826773    .7816592
       _cons |   6.677604   7.068737     0.94   0.345    -7.195586    20.55079
-------------+----------------------------------------------------------------
     sigma_u |  1.2603818
     sigma_e |   .23398851
         rho |   .96668278   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. test contracts=0

 ( 1)  contracts = 0

       F(  1,   897) =   10.81
            Prob > F =    0.0010
```

Figure 3.25: Stata output of the simple regression for closing a business variable and the respective Wald test

```
. xtreg  lnfdi lngdp lngdppc gdpgrowth openness close _Iyear_*, fe vce (robust)

Fixed-effects (within) regression               Number of obs      =      1019
Group variable: economy                         Number of groups   =       159

R-sq:  within  = 0.7128                         Obs per group: min =         2
       between = 0.7953                                        avg =       6.4
       overall = 0.8021                                        max =         7

                                                F(11,849)          =    163.10
corr(u_i, Xb)  = 0.6203                         Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .6403778   .4363049     1.47   0.143    -.2159849    1.496741
     lngdppc |  -.2252813   .4325052    -0.52   0.603    -1.074186    .6236236
  gdpgrowth |   .0000684   .0031738     0.02   0.983    -.0061609    .0062977
   openness |   .3199786   .1111415     2.88   0.004     .1018342    .5381229
      close |   .0767326   .0420002     1.83   0.068    -.0057039     .159169
 _Iyear_2004 |    .087409   .0374051     2.34   0.020     .0139917    .1608264
 _Iyear_2005 |    .132995   .0421347     3.16   0.002     .0502947    .2156953
 _Iyear_2006 |   .3039124    .050689     6.00   0.000      .204422    .4034028
 _Iyear_2007 |   .4728849   .0660432     7.16   0.000     .3432577    .6025121
 _Iyear_2008 |    .464908   .0824955     5.64   0.000      .302989    .6268269
 _Iyear_2009 |    .649533   .0768133     8.46   0.000     .4987668    .8002992
       _cons |   8.209994    7.1774     1.14   0.253    -5.877535    22.29752
-------------+----------------------------------------------------------------
     sigma_u |  1.3037129
     sigma_e |   .23068538
         rho |   .96964102   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. test close=0

 ( 1)  close = 0

       F(  1,   849) =    3.34
            Prob > F =    0.0681
```

Figure 3.26: Stata output of Hausman test to the simple regression of global variable

```
. xtreg lnfdi lngdp lngdppc  gdpgrowth openness global _Iyear_*, fe vce(robust)

Fixed-effects (within) regression               Number of obs      =       709
Group variable: economy                         Number of groups   =       158

R-sq:  within  = 0.6912                         Obs per group: min =         1
       between = 0.6794                                        avg =       4.5
       overall = 0.7024                                        max =         5

                                                F(9,542)           =    117.56
corr(u_i, Xb)  = 0.3431                         Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
      lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .7780838   .3555032     2.19   0.029     .0797508    1.476417
     lngdppc |  -.5000884    .342013    -1.46   0.144    -1.171922    .1717449
   gdpgrowth |    .005523   .0031856     1.73   0.084    -.0007346    .0117805
    openness |   .2418479   .1208315     2.00   0.046     .0044925    .4792033
      global |    .388399   .0745223     5.21   0.000      .242011     .534787
 _Iyear_2004 |  (dropped)
 _Iyear_2005 |  -.4889354   .0623126    -7.85   0.000    -.6113393   -.3665316
 _Iyear_2006 |  -.3349151   .0500571    -6.69   0.000    -.4332448   -.2365853
 _Iyear_2007 |  -.1579125   .0343892    -4.59   0.000     -.225465   -.0903601
 _Iyear_2008 |  -.1621238   .0289798    -5.59   0.000    -.2190502   -.1051974
 _Iyear_2009 |  (dropped)
       _cons |   5.585508   6.220308     0.90   0.370    -6.633357    17.80437
-------------+----------------------------------------------------------------
     sigma_u |  1.3482289
     sigma_e |  .18283033
         rho |  .9819426   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store fixedeffects


. xtreg lnfdi lngdp lngdppc  gdpgrowth openness global _Iyear_*, re vce(robust)
note: _Iyear_2004 dropped because of collinearity
note: _Iyear_2009 dropped because of collinearity

Random-effects GLS regression                   Number of obs      =       709
Group variable: economy                         Number of groups   =       158

R-sq:  within  = 0.6672                         Obs per group: min =         1
       between = 0.8893                                        avg =       4.5
       overall = 0.8979                                        max =         5

Random effects u_i ~ Gaussian                   Wald chi2(9)       =   1828.46
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
      lnfdi |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .8132861    .032581    24.96   0.000     .7494285    .8771437
     lngdppc |   .0342632   .0573493     0.60   0.550    -.0781395    .1466658
   gdpgrowth |   .0015753   .0030341     0.52   0.604    -.0043715    .0075221
    openness |   .6403598   .0858763     7.46   0.000     .4720453    .8086743
      global |   .3452204   .0657021     5.25   0.000     .2164467    .4739942
 _Iyear_2005 |  -.3108652   .0350741    -8.86   0.000    -.3796092   -.2421212
 _Iyear_2006 |  -.2276115   .0327849    -6.94   0.000    -.2918687   -.1633542
 _Iyear_2007 |  -.1407893   .0310196    -4.54   0.000    -.2015866    -.079992
 _Iyear_2008 |   -.236731    .027671    -8.56   0.000    -.2909653   -.1824968
       _cons |   .1992956   .7043033     0.28   0.777    -1.181113    1.579705
-------------+----------------------------------------------------------------
     sigma_u |  .73858073
     sigma_e |  .18283033
         rho |  .94226069   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store randomeffects

.


. hausman fixedeffects randomeffects

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             | fixedeffects randomeffe~s    Difference          S.E.
-------------+----------------------------------------------------------------
       lngdp |   .7780838    .8132861      -.0352024        .3540071
     lngdppc |  -.5000884    .0342632      -.5343515        .3371705
   gdpgrowth |    .005523    .0015753       .0039477        .0009705
    openness |   .2418479    .6403598      -.3985119         .085003
      global |    .388399    .3452204       .0431785        .0351683
 _Iyear_2005 |  -.4889354   -.3108652      -.1780702        .0515041
 _Iyear_2006 |  -.3349151   -.2276115      -.1073036        .0378268
 _Iyear_2007 |  -.1579125   -.1407893      -.0171232        .0148459
 _Iyear_2008 |  -.1621238    -.236731       .0746072        .0086104
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       16.42
                Prob>chi2 =      0.0586
                (V_b-V_B is not positive definite)

.
```

Figure 3.27: Stata output of Hausman test to the simple regression with all institutional variables

```
. xtreg lnfdi lngdp lngdppc  gdpgrowth openness  startbusi construct property credit investors taxes trade contracts close  _Iyear_*
> , fe vce (robust)

Fixed-effects (within) regression               Number of obs      =       709
Group variable: economy                         Number of groups   =       158

R-sq:  within  = 0.7166                         Obs per group: min =         1
       between = 0.7588                                        avg =       4.5
       overall = 0.7645                                        max =         5

                                                F(17,534)          =     69.31
corr(u_i, Xb)  = 0.6177                         Prob > F           =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .5550813   .3110245     1.78   0.075    -.0559003    1.166063
     lngdppc |   -.330692   .3038378    -1.09   0.277    -.9275559    .2661719
   gdpgrowth |   .0061715   .0029984     2.06   0.040     .0002814    .0120617
    openness |   .2672793   .1151052     2.32   0.021     .0411647     .493394
   startbusi |   .2761028   .0856616     3.22   0.001     .1078278    .4443779
   construct |   -.129887   .0640018    -2.03   0.043    -.2556132   -.0041608
    property |   .1098438    .033561     3.27   0.001     .0439161    .1757715
      credit |    .023492   .0223296     1.05   0.293    -.0203726    .0673567
   investors |  -.0501206   .0268253    -1.87   0.062    -.1028168    .0025755
       taxes |   .1110093   .0638111     1.74   0.082    -.0143424    .2363609
       trade |   .1161943   .0314096     3.70   0.000     .0544927    .1778959
   contracts |  -.0272653   .0937578    -0.29   0.771    -.2114445     .156914
       close |   .0816191   .0495814     1.65   0.100    -.0157795    .1790176
  _Iyear_2004 |  (dropped)
  _Iyear_2005 |  -.4823729   .0608735    -7.92   0.000    -.6019539   -.3627919
  _Iyear_2006 |  -.3386278   .0499791    -6.78   0.000    -.4368075   -.2404482
  _Iyear_2007 |  -.1643285   .0357711    -4.59   0.000    -.2345979   -.0940591
  _Iyear_2008 |  -.1627992   .0281604    -5.78   0.000    -.2181181   -.1074804
  _Iyear_2009 |  (dropped)
        _cons |   8.102114   5.711635     1.42   0.157    -3.117915    19.32214
-------------+----------------------------------------------------------------
     sigma_u |  1.4082634
     sigma_e |   .17646288
         rho |   .9845413   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store fixedeffect
```

```
. xtreg lnfdi lngdp lngdppc  gdpgrowth openness  startbusi construct property credit investors taxes trade contracts close  _Iyear_*
> , re vce (robust)
note: _Iyear_2004 dropped because of collinearity
note: _Iyear_2009 dropped because of collinearity

Random-effects GLS regression                   Number of obs      =       709
Group variable: economy                         Number of groups   =       158

R-sq:  within  = 0.6920                         Obs per group: min =         1
       between = 0.8877                                        avg =       4.5
       overall = 0.8943                                        max =         5

Random effects u_i ~ Gaussian                   Wald chi2(17)      =   2282.86
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                                (Std. Err. adjusted for clustering on economy)
------------------------------------------------------------------------------
             |               Robust
       lnfdi |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lngdp |   .8092236   .0353045    22.92   0.000     .7400281    .8784191
     lngdppc |  -.0229028    .061241    -0.37   0.708    -.1429329    .0971273
   gdpgrowth |   .0015384   .0029485     0.52   0.602    -.0042406    .0073174
    openness |   .6146443   .0836457     7.35   0.000     .4507017    .7785869
   startbusi |   .2013778   .0825227     2.44   0.015     .0396363    .3631192
   construct |  -.0736459   .0588224    -1.25   0.211    -.1889357     .041644
    property |   .0576004   .0356512     1.62   0.106    -.0122745    .1274754
      credit |   .0230444   .0200373     1.15   0.250    -.0162279    .0623168
   investors |  -.0459049   .0228414    -2.01   0.044    -.0906732   -.0011366
       taxes |   .0438146    .057687     0.76   0.448    -.0692497     .156879
       trade |   .1384581   .0283923     4.88   0.000     .0828102    .1941059
   contracts |    .075974   .0553143     1.37   0.170      -.03244     .184388
       close |   .0851721   .0437405     1.95   0.052    -.0005578     .170902
  _Iyear_2005 |  -.304107   .0376373    -8.08   0.000    -.3778748   -.2303392
  _Iyear_2006 |  -.2306092   .0369213    -6.25   0.000    -.3029737   -.1582448
  _Iyear_2007 |  -.1471594   .0330829    -4.45   0.000    -.2120008    -.082318
  _Iyear_2008 |  -.2288106   .0268342    -8.53   0.000    -.2814046   -.1762165
        _cons |  -.7347792   1.252439    -0.59   0.557    -3.189514    1.719955
-------------+----------------------------------------------------------------
     sigma_u |  .73431312
     sigma_e |   .17646288
         rho |   .94540391   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store randoeffect

.
```

```
. hausman fixedeffect randoeffect
```

	Coefficients (b) fixedeffect	(B) randoeffect	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
lngdp	.5550813	.8092236	-.2541424	.3090143
lngdppc	-.330692	-.0229028	-.3077892	.297602
gdpgrowth	.0061715	.0015384	.0046331	.0005447
openness	.2672793	.6146443	-.347365	.0790735
startbusi	.2761028	.2013778	.0747251	.0229765
construct	-.129887	-.0736459	-.0562411	.0252221
property	.1098438	.0576004	.0522434	.
credit	.023492	.0230444	.0004476	.0098549
investors	-.0501206	-.0459049	-.0042157	.0140666
taxes	.1110093	.0438146	.0671946	.0272778
trade	.1161943	.1384581	-.0222638	.0134329
contracts	-.0272653	.075974	-.1032392	.0757024
close	.0816191	.0851721	-.003553	.023347
_Iyear_2005	-.4823729	-.304107	-.1782659	.0478437
_Iyear_2006	-.3386278	-.2306092	-.1080186	.0336857
_Iyear_2007	-.1643285	-.1471594	-.0171691	.0136049
_Iyear_2008	-.1627992	-.2288106	.0660113	.0085404

```
                b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                chi2(17) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                         =   -17.13    chi2<0 ==> model fitted on these
                                       data fails to meet the asymptotic
                                       assumptions of the Hausman test;
                                       see suest for a generalized test
```